

The Commercial Car Journal

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Standardized *Training* of Mechanics *Urged* at S. A. E. Meeting

WHEN commercial vehicle operators get together to discuss their problems the net result of their exchange of ideas is certain to be of great interest to truck dealers. This was proved when operators from various parts of the country congregated in Newark, N. J., Oct. 17-19, and participated in the annual transportation meeting of the Society of Automotive Engineers.

The broad subject of "Getting and Holding Business for the Motor Truck" was ably handled at the Motor Haulage Session by George W. Daniels, of the United States Trucking Corp. Business can best be got, in Mr. Daniels' opinion, if the truck operator is sure of his rates, has the nerve to submit them, even though the customer may believe them to be high, sticks to them, studies how best to aid the customer, suggests ways and means whereby the customer might save money in shipping, and has tenacity of purpose in attempting to get new work.

Elaborating upon the first of these points, Mr. Daniels declared that to know rates a truckman must know costs; to know costs he must be experienced, and to be considered thoroughly seasoned, he must know not only the practical side of truck operation, but the scientific side as well.

Since the bulk of trucking must be solicited, Mr. Daniels observed that in the efficiency of that solicitation, together with the submitting of rates, scientifically arrived at, must depend the prosperity of the business.

The speaker voiced his disapproval of employing solicitors on a commission basis and of the wholesale solicitation of trucking through circular letters. It appeared to be his contention that both cases led to impossible promises of impossible performances. In his judgment it is better to employ men on a regular salary, and to have them schooled by practical operating men, to the end that they will know what the trucking firm can and cannot do.

Taking the second part of his subject, that

By *George T. Hook*

dealing with "holding business," Mr. Daniels' recommendations to truck operators may be summarized as follows:

Service with a capital S, because if

the operator gives the customer service, he can't very well ask him to cut his rates.

Prompt investigation of claims, and prompt settlement if the fault is the operator's.

Courteous treatment of customers by drivers and helpers.

Exercising care in submitting bills and statements. When charges are higher than rates previously agreed upon, a letter of explanation should accompany the bill. Bills should be submitted promptly, and paid promptly.

Keeping well informed of what is going on in the industry, in business and, more particularly, what the other fellow is doing. He may have a new plan which will revolutionize the industry, the methods used in hauling freight.

At this session the complaint again came up that manufacturers are selling commercial vehicles to irresponsible operators, to the detriment of established businesses. Alfred Reeves, general manager of the National Automobile Chamber of Commerce, observed that restriction of sales was hardly a legal policy, and pointed out that fully to meet the demands of operators would seriously cut into the market for commercial vehicles.

Mr. Reeves urged greater cooperation on the part of operators, pointing out the benefits to manufacturers that had come through cooperation, and declared that if the operators were strongly united there would be less chance of unfavorable legislation and a much better opportunity for fostering favorable laws.

Truck manufacturers belonging to the National Automobile Chamber of Commerce consider better cooperation between truck owners so important that they have authorized a campaign to enlarge the membership of the Motor Truck Club of New Jersey, with headquarters at Newark, and to increase substantially the service it renders

THE many pertinent subjects dealing directly with the operation of commercial vehicles discussed at this meeting should be of great value to all dealers and salesmen interested in doing better transportation selling jobs.

A study of the problems propounded there will give the seller an excellent insight of the operator's problems and what the operators are thinking about.



Left: F. C. Horner, who conducted the Store-Door Delivery Session

Center: Dr. Miller McClintock discussed traffic conditions at the banquet

Below: J. F. Winchester, who was chairman of the session on business of transportation



to members, Mr. Reeves announced.

In the informal discussion at the Motor Haulage Session misrepresentation—whether willful or ignorant—by truck salesmen was cited as being one of the causes of cut-throat competition in the truck business. W. F. Lyon, vice-president of the Motor Haulage Co., Inc., of Brooklyn, averred that he knew of several cases where truck salesmen quoted ridiculous operating figures to prospective truckmen and on that basis sold them equipment. It was logical, he explained, for the truckmen to base their rates on these figures, with the result that price cutting ensued.

Presentation of reports took up the session of the Operation and Maintenance Committee of the S.A.E.

More information on chassis parts from truck manufacturers was declared an urgent need in the report of J. F. Winchester, of the Standard Oil Co. of New Jersey. The report declared:

"There are certain ones who advocate that the manufacturer's chassis parts book, which accompanies each truck sold, covers in detail all the information it is necessary for an operator to have. Yet no provision is made to give in this book an exact indication of the type of equipment supplied in any individual truck. For instance, if an operator breaks a side rail he cannot order it direct from the parts book without going to the trouble to measure the wheelbase of the truck.

"Various units for different classes of work, as is well known, vary in detail as regards the combination of gears placed in the gearbox, or in the rear axle. The parts book in no way indicates what combination is placed within a given unit."

Air cleaners have reduced maintenance costs from 20 to 45 per cent in some instances and have extended the period between overhauls from 36 to several hundred per cent, according to the report on the "Effect of Accessories on Maintenance Costs" of E. C. Wood, of the Pacific Gas & Electric Co.

Oil filters not only effect savings of oil but likewise increase the life of engines, in the opinion of several operators quoted in the report. The change period of filter elements was held to vary from 10,000 to 20,000 miles, according to the make and type of filter used. Operators in isolated sections said they experienced difficulty in bringing about a regular exchange of cartridge or element at the proper time.

Serious consideration by the Society of Automotive Engineers of a project of developing a standard course for the training of mechanics was recommended by a subcommittee detailed to report on the "Selection and Training of Automobile Mechanics."

"There are in the United States today," said the report, "more than 300,000 automobile mechanics, most of whom have learned their trade by the trial and error method. At least 100,000 new repairmen are needed a year to replace the losses in the ranks and to care for the increased work. Incompetent labor is expensive."

While schools for training mechanics exist, the report stated that "some service managers will not bother with graduates because their experience has been that only about one out of five is adapted to the work.

If a standard course should be adopted, the report pointed out that it "would be of no value unless some means were provided for checking either the school or the graduate," and recommended that "the shop work of the course be handled on a cooperative basis with service stations," an arrangement whereby a student would work alternately in the service station and then in the school shop.

Ethelbert Favary, of the Moreland Motor Truck Co., Los Angeles, worked up the report on the "Selection, Training and Payment of Motor-Vehicle Drivers," which recommended that one man in the organization have full responsibility for the selection of drivers. He should possess broad experience in judging human nature and in all phases of motor vehicle operation. Particularly the latter, it was shown, because different types and models of motor vehicles require different driver qualifications. The report reviewed in considerable detail existing methods of choosing, training and compensating drivers, and suggested that "the most profitable committee work to be done on this subject is to study the best methods or devise new methods for the selection of drivers.

The report on "Man Power Required Per Vehicle Operated and Seasonal Fluctuations," presented by F. C.



Horner, of General Motors Corp., revealed some interesting statistics compiled as the result of questionnaire replies received from 38 fleet operators in various parts of the country. Following is the summary of replies presented in the report:

The percentage of annual maintenance cost represented by work done in outside shops ranges from zero to 75 per cent of the total. Out of 35 companies, nine reported no work at all performed in outside shops; 19 reported less than 5 per cent, and seven companies more than 5 per cent.

The total annual maintenance cost due to accidents (the gross cost of accident repairs without any deduction for amounts recovered from insurance companies or from other parties is used) as reported by 28 companies is 1 per cent or less in the case of 15 companies; between 1 per cent and 5 per cent in the case of seven companies, and over 5 per cent in the case of six companies, ranging up to 22 per cent in one instance.

Non-productive labor, such as clerical help, supervision, stock clerks and the like, ranges from one-tenth of 1 per cent to 27 per cent of the total annual maintenance cost, based on the reports of 29 companies.

The average number of men employed for garage service, which includes supplying gasoline, oil and water, routine inspection, tire inflation, adjustment, lubrication and washing, as represented by the average number of vehicles per man, based on reports from 10 bus companies operating 1156 vehicles and employing 290 men, is one man for every four buses. As to motor trucks, 19 companies operating 3929 vehicles and employing 290 men average 13.5 vehicles per man.

The average number of men employed in repair work, as represented by the average number of vehicles per man, based on reports from 10 bus companies operating 1156 vehicles and employing 472 men, is 2.5 buses per man. As to motor trucks, 19 companies operating 3929 vehicles and employing 584 men average 6.7 vehicles per man.

The average number of hours worked per month by employees of the maintenance department, based on the reports of 15 companies operating motor trucks, is 221 hours, and, in the case of buses, based on the reports of 13 companies, is 231 hours.

The reports showed that seasonal variation as a factor affecting the maintenance men employed during the year is not of very great importance.

The real job of the fleet superintendent, according to Donald Blanchard, of the Chilton Class Journal Co., calls for keen business judgment, broad engineering knowledge, a practical understanding of accounting, some acquaintance with the law, an appre-

Right: Alfred Reeves spoke on owner cooperation and organization

Center: E. C. Wood, who delved deeply in two important service problems

Below: A. F. Masury, who was chairman of the Six-Wheel Vehicle Design vs. Legislation symposium



ciation of the principles of scientific management and the ability to handle personnel.

The symposium on highway legislation and the six-wheel truck, and the effect of six-wheel vehicles on highway design, participated in by Ethelbert Favary, of the Moreland Motor Truck Co.; Robert T. Hendrickson, of the Hendrickson Motor Truck Co.; T.

H. MacDonald, chief of the Bureau of Public Roads, as well as others, brought out many claims from an operating standpoint for the utility of this type of vehicle. While not all the statements passed unchallenged, the main point at issue appears to be that states are being urged to legislate in favor of the six-wheel truck and are generally acceding to the demands.

"Store-door delivery," said Chairman Horner in opening the session devoted to this subject, "has been bitterly opposed by many transportation men and merchants, but we are coming to the time when differences of opinion will be ironed out and we will have some form of store-door delivery service in this country."

Store-door delivery as practiced in Canada was de-

(Turn to page 36, please)

Complete Shop Service

*Contented Employees and Adver
Personnel Also Contrib
Earl B. Staley,*

By Mandus E.



Earl B. Staley.
"The basic suc-
cess of any
business is
customer sat-
isfaction"



Where all kinds of automotive maintenance work is handled. The Staley shop, Seattle, Wash.

EARL B. STALEY, INC., Seattle, Wash., which secures 75 per cent of its income from servicing commercial trucks, last year chalked up a \$500,000 volume. In view of the fact that the concern is only six years old, the record is noteworthy—one of the outstanding achievements in the automobile industry of the Pacific Northwest.

Though business successes often may be accounted for only by something intangible—wrapped up in executive personality and energy that is difficult to pass on in the form of practical methods—in this case there is a definite program that has contributed not a little to the accomplishments of the Staley company. To be sure the technical training of Mr. Staley, his capacity for hard work and enthusiastic leadership, is the basic reason for the growth of his company.

However, there are three major factors that are definite enough to be included in management program and described as such.

1. A complete repair and manufacturing service that includes all kinds of maintenance—machine shop, body

building, upholstery work, painting, automotive electrical department, engineering department which designs and blueprints.

2. Employee relationship that means more than the weekly pay check.

3. A program of advertising that is based on the two above-listed policies.

There is a definite reason why the Earl B. Staley, Inc., boasts that it can solve any automotive problem that may present itself—and that under one roof. This firm can make any motor car part, whether for passenger car or truck. It particularly aims to give a complete maintenance service to the commercial truck operator, whose problems are legion. Of course, there is a decided financial advantage directly in being able to do all kinds of automotive service work; no need of splitting profits with the specialty men and custom houses.

But the real motive is to enable the firm to give a first-hand guarantee of the entire job. No need of passing the buck or making alibis on work that has been "farmed out" to other specialty firms.

"The basic success of any business is customer satisfaction," Mr. Staley declared. "If part of a job is done outside of our own shops, I have no personal assurance that it is as it should be. The guarantee of workmanship and materials doesn't mean much if the job goes wrong. Even though the faulty job is corrected, the

Builds \$500,000 Volume

*tising of Both the Service and
ute to the Success of
Inc., Seattle*

Bridston

customer remembers the inconvenience of the comeback. Every such occurrence is another blow to customer goodwill.

"We have equipped our plant with men and machinery that enables us to do any kind of automotive job under one roof, and one management. Responsibility is fixed, and means are at our disposal to correct any chronic ailment that may evince itself. Everyone makes mistakes, at times, but I want the satisfaction of being able to run them down and find out what's what. Of course, it

would require less investment in equipment, and perhaps be cheaper to depend on outside specialty mechanics for certain types of work, but I am convinced this added investment and maintenance expense is eminently worthwhile as insurance of customer satisfaction. We know that every part of the job is done right, and hence our statements of that fact carry conviction."

This complete service is doubly important to the firm catering to the commercial car operator. His needs often extend far beyond ordinary maintenance work. Mayhap his business demands a unique type of truck body. Staley's engineers can design such equipment, draw and blueprint the plans and execute them in the shops from stem to stern. At the time the writer interviewed Mr. Staley he had one order for 10 truck bodies under construction. At another time a Seattle wood dealer brought his truck problem to Staley for solution. The result was an ingenious combination of the leverage principle and the use of an underbody hydraulic hoist in the construction of a truck body that can be elevated 11 ft., carrying a load of over 5 tons. By changing a bolt, this same truck can be converted into a dump body as well.

The firm's letterhead enumerates the wide range of commercial truck equipment that is made in the company's shops: steel dump bodies, truck bodies, steel body bol-

sters, steel frames for wooden bodies, steel cabs, windshields, lumber rolls, log loaders, truck tanks, steel flushers, trailer hitches. Supplementing this service the Staley company is distributor for a number of equipment and accessory firms.

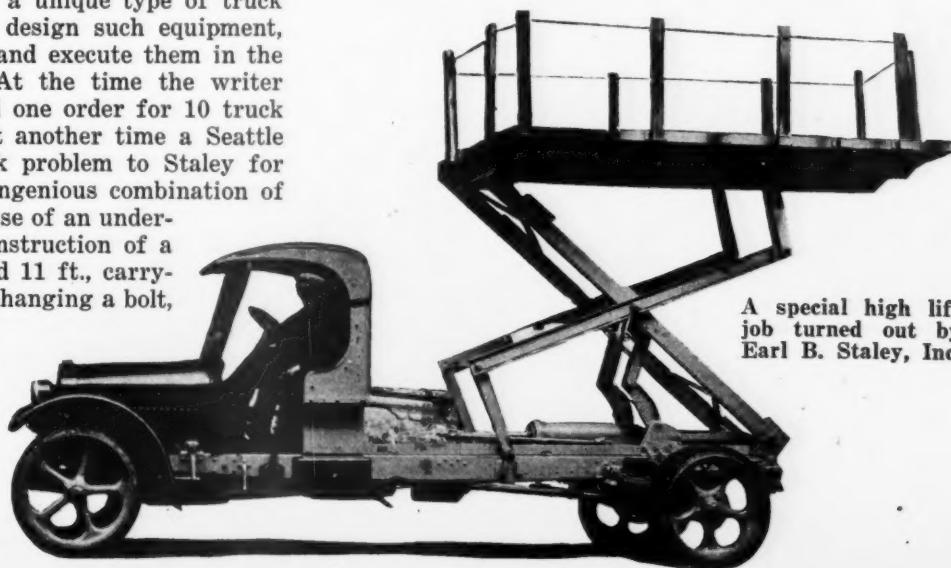
The type of service offered the commercial fleet operator by the Staley company requires a staff of highly skilled mechanics. The usual run of floaters won't do. This firm now has a personnel of 65, built up in six years from a staff of two.

"There is one factor that I always try to keep in mind in considering the important problem of employee relationship," commented Mr. Staley. "It is of the utmost importance to keep labor turnover at a minimum, secure and keep the best type of workers, and at the same time hold the payroll within reasonable limits. It is a simple matter to pay above-scale wages, if the annual profits are not considered, but even that is not the one best solution of the labor problem.

"More important it is to remember that men work for something besides the weekly pay-check. If something besides greenbacks are included as wages, the size of the pay-check is not of major importance. Contented workers, who like their jobs, with hope of advancement and a bright future, are more efficient and loyal to the firm. They become the kind of employees that pay dividends and insure satisfied customers. This kind of compensation we might term 'mental wages.' There are many ways of paying this kind of a wage. In the first place we try to fit every man in the kind of a job he likes and consequently can do well. We see to it that he learns this job well so that he can take pride in it.

"For instance, the helper in our engineering department has been with us about two years learning designing and draftsmanship. However, we don't keep him in this department exclusively. At the present time he is wearing overalls in the body-building shop. He assisted our engineer in designing and drawing up plans for an order of 10 truck bodies. Now he is a helper in the construction work learning the practical

(Turn to page 36, please)



A special high lift job turned out by Earl B. Staley, Inc.

Reminder Sells Repeat Service

Russell P. Taber, Inc., Hartford, Conn., gets owner in the habit of coming back for service by placing indicator in truck



The day and night service station of Russell P. Taber, Inc., Reo dealer of Hartford, Conn.

WE have encountered many knotty problems in our business and we have spent much time and thought in overcoming them, but the ultimate solution always is very simple," according to statement made by Russell P. Taber, president of Russell P. Taber, Inc., Reo dealer of Hartford, Conn.

One of the problems for which he has found a simple solution is that of maintaining contact with customers and inducing them to take advantage of the facilities of the company's service department.

An inexpensive holder for numbers showing the next mileage at which three common preventive maintenance jobs should be performed accomplishes the purpose for the company. The holder, shown in an illustration, is made of stitched fabric with three compartments each covered with celluloid. The upper compartment is labeled "Oil and Grease," the second "Grease Front Wheels" and the third "General Tightening." When a truck is delivered to a customer the holder is attached to the roof of the cab over the windshield or some other convenient place and cards denoting mileage placed in each of the compartments. The original numbers are 500 in the first, 3000 in the second and 5000 in the third slide. The person making delivery of the truck calls the attention of the new owner to the holder and the importance of regular preventive maintenance operations. No charge is made for the operations during the first ninety days after the truck is delivered. This "no charge" period aids in getting the owner in the habit of coming for service, as Mr. Taber stated.

When a truck is brought in for one of the operations the mechanic changes the card to show the mileage at which the vehicle should be brought to the service station again for that operation.

The holders have an important advantage over the use of stickers on the face of the speedometer or one of the other "clocks" on the dashboard, in the opinion of Mr. Taber. He pointed out that the holder makes an impression on the owner because it is permanent. In addition it becomes fixed in the mind of the owner or driver as the place to look occasionally for guidance concerning the next trip

to a service station for lubrication or adjustment.

Preventive maintenance operations are offered the owner at flat rate prices at the expiration of the ninety day period. There are 21 operations ranging from "Oil starter plunger" costing 16 cents to a general lubrication listed at \$4.55.

All lubrication work is guaranteed, so much so in fact that the company will replace any parts which are prematurely worn out through lack of lubrication provided the vehicle has been lubricated by it according to schedule. Such a guarantee impresses an owner with the fact that the work will be done properly, as Mr. Taber pointed out, and it also convinces him that preventive maintenance operations really prevent trouble.

After further use of a truck makes it necessary to have repair work performed, the owner finds the Taber organization just as willing and able to help him as before. The service station is open day and night to truck owners. Night service is no novelty to Reo owners in Hartford because the Taber service station has been providing it for almost fifteen years. The same price is charged at night as in the daytime.

Night service makes a particular appeal to the smaller milk dealers. Their trucks start on routes early in the morning and in case of any trouble before starting or on the route service is available immediately. One milk dealer expressed his appreciation of night service to the company by saying that he had not missed a trip at 2 a.m. for five years.

Supplementing night service is a truck rental plan which makes a truck available to an owner whose truck is tied up in the shop. This plan is of particular value when trouble develops while a truck is in operation or just before it starts on a route. It is also useful in case of accidents to trucks in small fleets, or single trucks.

Lubrication and other preventive maintenance operations are performed at night for customers who desire such an arrangement, some of the trucks sent for lubrication at night are used all day and can be spared only at night. Several owners use this service.



This service indicator serves as a constant tie-up between owner and dealer

Truck Expansion Needs Public Realization of Possibilities

*So Said George P. Anderson, Graham Brothers Engineer, at the
Mid-West Congress. Legislation, Truck Terminals and
Special Farm Trucks Among Other Timely
Topics Discussed*

THE future use of motor trucks depends not so much on advances in engineering design as it does on the public's realization of its possibilities—in other words, on favorable truck consciousness."

This declaration was made by George P. Anderson, transportation engineer, Graham Truck Division of the Dodge Brothers Corp., at the Mid-West Motor Truck Transportation Congress held in Indianapolis, Oct. 23-26.

"With increased application of motor trucks along the lines in which they have already proved their value,"

Mr. Anderson prophesied, "special types of service will develop which will in turn provide a market for specialized design best suited for each type of service. Engineers have facilities for designing trucks meeting transportation needs not yet developed. It remains only for the market to open under direction of experienced operators to bring about the production of trucks that will fill any requirement. In spite of the widespread use we now make of motor trucks, the present application to hauling problems falls far short of obvious possibilities."

Mr. Anderson explained the vitalness of the motor trucks as a factor in national prosperity and declared that because the future of trucking depends upon public appreciation, those in the business of operating and manufacturing motor trucks owe it not only to their own welfare, but also to the country's progress, to do all in their power to prompt this appreciation and understanding.

Statistical evidence was presented by Mr. Anderson demonstrating the great proportion of business and productive units of small size.

"This," he argued, "is a natural fertile field for a large amount of professional hauling, and the indications are that there is room for a tremendous development of this type of work for motor trucks. Instead of 7 per cent of the trucks being used for this work, I believe the economic advantage of the country requires a much greater amount of professional hauling."

"The motor truck," he concluded, "has already played an important part in advancing our civilization. It is logically destined to go further in carrying the material

comforts of large cities to small and isolated communities, and in advancing the economy of small as well as big business. The truck is assuredly to be more and more of a vital factor in national prosperity."

Matters of considerable importance in the truck industry were given a beneficial airing at the Congress. The advantages of central truck terminals, state reciprocal relations, legislation, taxation and other timely topics received particular attention.

The Congress was attended by operators from a number of Mid-Western

states and by truck association executives representing 19 organizations. The latter group took advantage of the occasion to form an organization to be known as the Truck Association Executives of America, the purpose of which, according to the constitution, "is the benefit and development, and interchange of information and experience of those engaged in operating motor truck associations." Officers elected were: Chairman, W. H. Brearley, counsel to the Autocar Co., Ardmore, Pa., and vice-president of the Pennsylvania Motor Truck Association, Inc.; vice-chairman, H. C. Kelting, secretary



George P. Anderson, transportation engineer, Graham Truck Division, Dodge Brothers Corp. Right: Tom Snyder, secretary, Motor Truck Association of Indiana

of the Kentucky Motor Truck Club; secretary-treasurer, T. A. Horrocks, secretary of the Minnesota Truck Owners Association.

There is reason to suppose that this organization will assume the responsibility of conducting an annual Motor Truck Transportation Congress, and will endeavor to enlist the cooperation of truck manufacturers and truck equipment and accessories makers in an exhibition of products.

For interest displayed and warmth of debate, legislation took first place among the subjects discussed by the Congress. The discussion, after Frank C. Schmidt, chairman of the board of directors of the Ohio Association of Commercial Haulers, had given a dissertation on interstate and intrastate truck regulation, developed a difference of opinion among the operators present. Some declared for immediate interstate legislation while others held that delay was not inadvisable, but there was unanimity in the feeling that interstate regulation is certain to come, and that if such is the case truck interests must unite to effect regulation that will not be prejudicial to them and whose operation will be placed in hands friendly and considerate to truck transportation.

Favor Gasoline Tax

Tom Snyder, secretary of the Motor Truck Association of Indiana, compared the gasoline tax to the vehicle license as a means of raising funds for highway construction, and following his exposition the Congress went on record by a unanimous rising vote favoring the gasoline tax as the only just means of raising road fund revenue and the return of the vehicle license to its original status of simply a means of identification and a modest fee therefor. Mr. Snyder declared that the vehicle license is responsible for state border problems and that at the next session of the Indiana legislature a bill will be proposed requiring the return of the license to its original status and the raising of road construction and maintenance revenue solely by a tax on gasoline consumed on the highways. It is proposed to make the license fee \$3 for all motor vehicles.

In approaching his subject of the business need of reciprocal relations in truck operations between bordering states, Frederick E. Schortemeier, secretary of state of Indiana and chairman of the reciprocal relations committee of the National Association of State Secretaries, said that state and national governments should look upon the truck industry as a fair and honest business enterprise, and that there should be no occasion for the governments to suspect that the truck industry is not law-abiding. He expressed the belief that there would be no need for Federal legislation interstate if states would enact laws embodying reciprocal rights, and urged operators to organize to protect and promote their own interests.

"The central motor truck terminal," declared Tom Snyder, who is also president and general manager of the Central Union Truck Terminal of Indianapolis, "is just as important to truck transportation as it is to railway operation. Terminals bring about uniformity and dependability and serve truck transportation in general and not individual truckers or shippers."

Mr. Snyder gave a detailed account of the operation of a truck terminal, and prophesied that the terminal of the future would be a warehouse.

H. C. Kelting, general manager of the Central Truck Depot, of Louisville, Ky., related some of the advantages of a terminal to the truck operator and the consignee and the nature of the questions asked by operators

and truck association executives indicated that terminal operation is receiving a great deal of thought, and imparted the feeling that wide adoption of the terminal plan of operation is a certainty.

"Cooperative organizations among the farmers both in their marketing of products and in their purchasing of supplies will for many years constantly increase the demand for motor trucks and will tend to demand particular types of trucks for certain services," according to Harvey B. Hartssock, attorney for the Indiana Farm Bureau Federation and other cooperatives.

"There will be developed in the next few years," he predicted, "live-stock trucks, grain trucks, creamery trucks, poultry trucks, fruit trucks, speed trucks for longer hauls from farm to city, and trucks especially fitted for moving among the city traffic and frequently stopping at customers' doors."

"Trucks of particular types will be purchased in great numbers by the farmers' cooperatives; motor truck manufacturers and salesmen will doubtless be awake to making contacts with and meeting the demands of truck purchasing cooperatives throughout the nation."

The ideal farm motor truck, in Mr. Hartssock's estimation, would be a combined tractor, motor truck and powerplant with accessories consisting of loading devices, demountable bodies, trailers, escalators, winches, plows and many other farm implements adapted to motor power. The field of designing and developing farm motor trucks, he held, is unlimited.

Live-Stock Trucking

The influence of motor truck transportation on live stock production and markets was revealed in figures by John Powell, president of the Indianapolis Live Stock Exchange. He presented statistics to show the increased use of trucks in transporting live stock to the Indianapolis yards. In 1922 trucks carried 33.25 per cent of the total receipts. Percentages for the succeeding years were as follows: 33.17 per cent in 1923; 33.02 in 1924; 37.46 in 1925; 40.85 in 1926; 46.07 in 1927 and 50.13 per cent in the first nine months of 1928.

In commenting on the usefulness of the truck to the live-stock producer, Mr. Powell said that it has reduced the time of delivery to such an extent that frequently stock is shipped from the farm to the stockyard without a pound of shrinkage.

The value of the truck in holding and developing trade territory was attested by Bert O'Leary, sales manager of the Kiefer-Stewart Co., wholesale druggists, Indianapolis.

"It is not overstating the facts," said Mr. O'Leary, "to say that during the past 10 years a revolution has taken place in the retail field, and that this revolution has been intensified from year to year; intensified no doubt by new methods in mass production, but intensified to a greater measure by improved methods of transportation and distribution."

"I am personally convinced that we are rapidly approaching the time when coordinated service between trucks and rails will be adopted. This no doubt will bring about a system of railroad car pooling by shipping groups, providing that the pooled car will be delivered to points beyond the economic truck haul, and that trucks will be used to render a local delivery from such pooled car into a 25 or 35-mile area."

A. M. Pearson, transportation engineer of the Federal Motor Truck Co., showed how cost in distribution and transportation may be reduced by a knowledge of the mathematics of transportation. He emphasized the value of the budget and cost accounting.

Commercial Car Journal

Flat Rate Price List Number 23

Reo Engines

Miscellaneous

1. Remove and replace engine assembly. Does not include transfer of accessories.
 - F4\$10.10
 - T68.60
 - Jr.10.70
 - F & G16.10
2. Remove and replace cylinder blocks, or renew gaskets.
 - F46.50
3. Renew cylinder block. Includes fitting and aligning all bearings.
 - T648.45
 - Jr.46.25
 - F & G60.95
5. Inspect internal condition of engine. Includes remove cylinder head, oil pan, and connecting rod assemblies, measure cylinder bores and pistons with micrometer or gage and reassemble.
 - F423.80
 - T613.10
 - Jr.14.15
 - F & G13.60
6. Tune engine. Includes clean and adjust breaker points and spark plugs, clean vacuum tank and carburetor screens, retune ignition, adjust carburetor and fan belt.
 - F44.50
 - Jr.4.60
 - F & G4.60
7. Tighten all engine support bolts.
 - T6, Jr., F & G75*
8. Clean engine.
 - F42.00
 - T61.75
 - Jr.1.75
 - F & G1.75
9. Check compression, tappets, ignition system, fuel system and all timing to locate engine miss.
 - F41.75
 - T62.00
 - Jr.2.00
 - F & G2.00

Cylinder Head and Oil Pan

10. Renew cylinder head gasket.
 - T6\$ 3.35
 - Jr.2.45
 - F & G3.35
12. Broken cylinder head stud, renew after head is off.
 - T655
 - Jr.55
 - F & G55
13. Oil pan, remove, clean and re-install.
 - T64.05
 - Jr.4.05
 - F & G4.60
- (A) Remove hand hole covers and replace, for inspection.
 - F490

Oil Pump

15. Oil pump, remove, inspect and replace.
 - F4\$ 6.85
 - T67.35
 - Jr.6.20
 - F & G5.60

Lubrication

17. Oil lines, clean after pan is off.
 - T6\$.75
 - Jr.75
 - F & G75
18. Make oil test on bearings after pan is off.
 - T62.00
 - Jr.2.00
 - F & G2.00
19. Oil pressure regulator adjust.
 - T64.00
 - F & G4.00

Piston Pins and Rings

1. Rings, renew all and align and adjust connecting rods.
 - F4\$17.00
 - T619.20
 - Jr.21.15
 - F & G19.70
2. Rings, renew all when connecting rods are out.
 - F44.20
 - T66.30
 - Jr.6.30
 - F & G6.30
3. Rings, renew all and align rods.
 - F415.90
 - T616.30
 - Jr.18.25
 - F & G16.80
4. Standard size piston pins and bushings, renew all, align and adjust connecting rods.
 - F413.80
 - T618.00
 - Jr.18.95
 - F & G19.45
5. Oversize piston pins, install all and align rods only.
 - F413.80
 - T613.50
 - Jr.15.45
 - F & G14.00

6. Rings and Piston Pins oversize, install all and align rods only.

F4	18.00
T6	19.80
Jr.	21.75
F & G	20.30

7. Oversize piston pin, install one after rod is out.

F4, T6, Jr., F & G	.80
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8. Oversize piston pins, install all, align and adjust rods.

F4	14.90
T6	16.40
Jr.	18.35
F & G	16.90

9. Oversize piston pins, install all after rods are out.

F4	2.10
T6	3.50
Jr.	3.50
F & G	3.50

10. Rings and piston pins oversize, install all, align and adjust rods.

F4	\$19.10
T6	22.70
Jr.	24.65
F & G	23.20

Piston Assemblies

11. Oversize piston, piston pin and ring assembly, install one by selection after connecting rods are out and cylinder head is removed.

T6	\$ 4.15
Jr.	4.15
F & G	4.15

- (A) Oversize piston, piston pin and ring assembly, install one by selection after connecting rods are out.

F4	4.15
----	------

12. Hone or bore one cylinder, adjust and align one connecting rod and install one oversize piston, piston pin and ring assembly after connecting rods are out and cylinder head is removed.

T6	6.50
Jr.	6.50
F & G	6.50

- (A) Hone or bore one cylinder, adjust and align one connecting rod and install one oversize piston, piston pin and ring assembly after connecting rods are out.

F4	6.50
----	------

13. Hone or bore all cylinders, align and adjust all rods and install all oversize pistons, piston pins and rings after connecting rods are out and cylinder head is removed.

T6	34.05
Jr.	34.05
F & G	34.05

- (A) Hone or bore all cylinders, align and adjust all rods and install all oversize pistons, piston pins and rings after connecting rods are out.

F4	21.50
----	-------

14. Hone or bore all cylinders, install all oversize pistons, piston pins and rings and align and adjust connecting rods.

F4	31.10
T6	44.75
Jr.	46.70
F & G	45.25

NOTE

Prices covering engine operations which appear on this page supersede those previously published. The arrangement of operations is the same as that of the Rapid Flat Rate Price List for passenger cars published by Chilton Class Journal Co. Variations have been made as required by the construction of the F-4 engine.

This four-cylinder engine has a barrel-type crankcase with hand holes in the side for access to the connecting rod lower ends. The front and rear main bearings are adjusted from beneath the chassis and the center main bearing from the hand holes.

Additional engine operations will be given in an early issue.



Spot Shop Defects

*By Searching Out Little Inefficiencies
Managers Are Effecting*

By James W.

MANY service managers and shop foremen have profited by making a careful check of each detail of shop method, management and layout. The purpose of making such a check is to seek any condition which is reducing general shop efficiency. In many cases they have found deficiencies which were hidden because the general condition of affairs was excellent.

A snag in a stream can cause a log jam which seems out of all proportion to the original cause. In like manner a minor fault in a shop may reduce the efficiency of other departments. In case one section is blocking the progress of work the fact becomes known and steps are taken to put an end to the trouble. But there is difficulty in detecting the little details which are none the less important because they are small. It is these little details which are attracting the attention of shop executives.

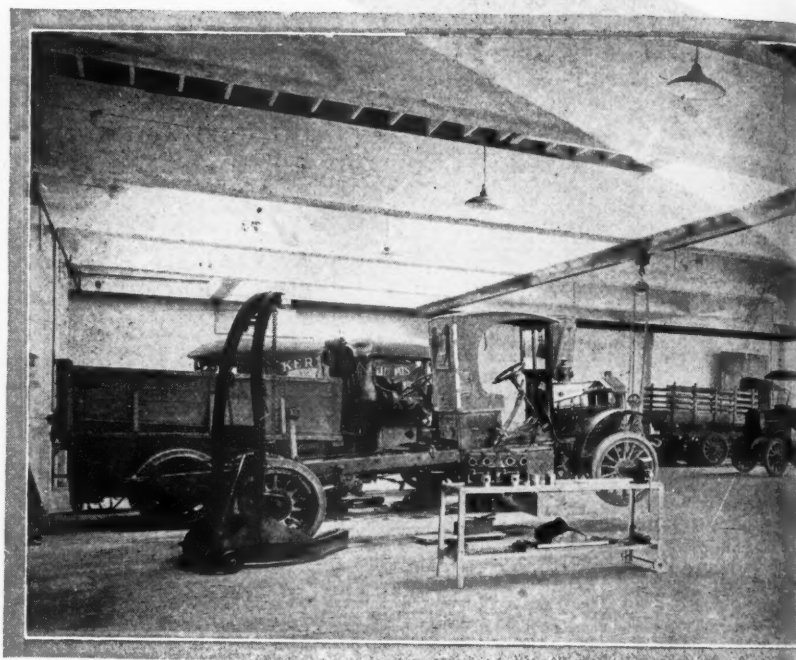
Methods and conditions which continue for a long time become fixed in the minds of those using them and are accepted as standards. Therefore many possible improvements may be overlooked unless a determined effort is made to gain an "outside" viewpoint.

Changes which have been made at slight cost as a result of such effort have brought large savings in time or material or both. In not a few cases shop executives have been surprised agreeably by the results obtained with small cost or investment. In other instances they have found justification for large expenditures for buildings and equipment because of the savings effected.

A method of supporting floor jacks, portable grease outfits and similar equipment, was worked out by one executive who happened to be in the shop one evening when the porter was washing the floors. He noticed that the porter moved each jack and grease outfit as he came to it, washed the floor space where it had been standing and then moved the machine back to its former location. In the course of floor scrubbing, some little water was splashed on the machines, causing them to rust.

All such floor equipment in this shop is now supported on light angle iron frames which are attached to the side walls. The frames are made with a sloping section on the end, similar to the runway on a grease rack and the jacks or greasers can be easily pushed up the incline onto the level section of angle iron. It is no longer necessary to move these machines when the floor is being washed and they are out of the way of splashing of water.

In a large shop where a parts cleaning tank is used,



it was found that a solution would evaporate very quickly if kept at boiling point. Although boiling temperature was not required for cleaning, the solution was allowed to boil in order to agitate it and hasten the cleaning of parts. A marked reduction in the amount of evaporation was brought about by installing a pipe having a row of holes through which air was discharged under pressure along the side of the tank. Good agitation of the solution was obtained by this method and the temperature of the solution was reduced with a marked saving of evaporation.

The door leading to the machine shop of a certain repair shop is just a few inches too narrow to allow a passenger car to pass. The size of the opening in the partition between the machine shop and the main repair floor did not just happen. The man in charge of the shop noticed that mechanics took their personal automobiles into the shop after hours in order to make use of the excellent repair facilities found there. This caused some confusion, due to the fact that tools were not always replaced properly and there was usually some little dirt left in the shop after cars were driven out. When some alterations were made in the building the doorway was changed so that it was impossible to

to Boost Profits

*Here and There Many Service
Worth-While Savings*

Cottrell

The time a mechanic spends at a stockroom window getting parts is unproductive. It is not easy to eliminate this loss but it can be reduced materially by giving thought to the subject. The number of trips to the stockroom and the length of time required for each can be cut by planning procedure. One means of shortening the time spent in getting parts is to provide a printed parts requisition for use by mechanics. If a mechanic tries to remember the parts needed as he proceeds with the disassembly of a unit some will be omitted and he will make two or three trips when one would serve. If he starts to get parts a few at a time as the work proceeds more visits will be made to the parts window than are necessary.

Delay at the parts window brings up the whole subject of parts stockkeeping, which cannot be dwelt upon at any length here. It may be that the parts room is the cause of delay. The test of this condition is the average length of time taken to fill a parts requisition.

Several shop executives, each of whom spent a few hours in their stockrooms; have found it possible to make worth-while changes. The time taken in searching through parts catalogs and price lists while a mechanic waits is one subject to which some attention is being directed. There is no trouble with items issued every day but there is loss of time in locating parts for which there is little call.

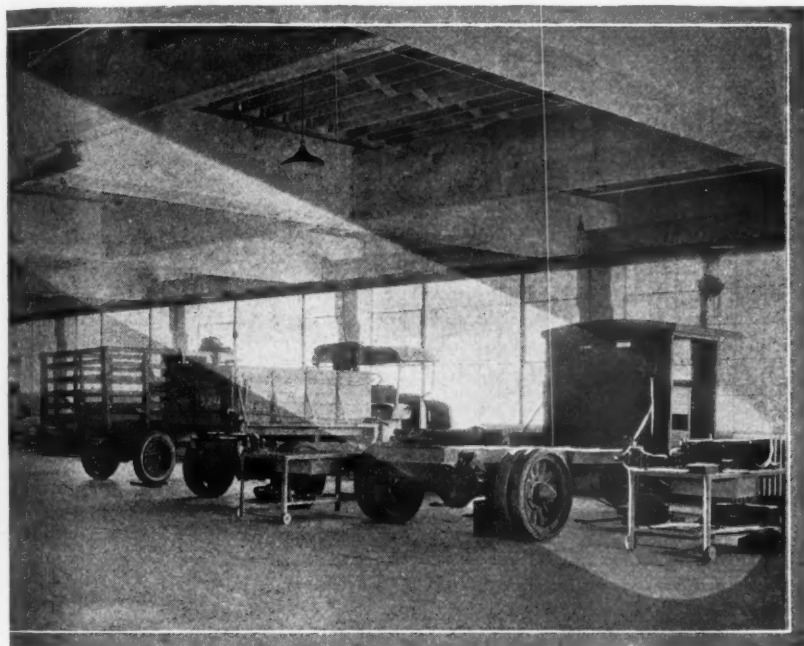
One handicap on shop efficiency which has been eliminated in many shops is that of issuing small bolts, nuts, washers, cotter pins, from the stockroom, with consequent record-keeping and billing. "We lost a lot of time handing out cotter pins as though they were silver-plated," was the expression of one shop superintendent. He placed all such small parts in bins to which mechanics have free access. Perhaps many are wasted but the cost of preventing it is greater than the waste.

Alert service managers are giving some thought to the movement of parts and of assemblies within their shops. The question becomes more important as the size of the shop increases and mechanics specialize to a greater and greater degree. In one shop it was found that an engine operation including adjustment of main and rod bearings, fitting new piston rings and pins, cleaning carbon and grinding valves and fitting new timing gears could be done at less cost by removing the engine from the chassis. This was due to excellent facilities for moving assemblies and the fact that the shop personnel is organized on the group plan, each group specializing on one unit.

Shop equipment and tools, like stockkeeping, comprise a broad subject not within the scope of this article. However, any searching about a shop for cause of delay or loss would be incomplete without a careful check of tools and shop equipment. Constant vigilance is required to keep any modern shop up-to-date. New models of trucks make it necessary to check up on tools for service operations on them. Special tools are being developed for overcoming difficulty with certain jobs. Any deficiency in tools or equipment will bring about an interruption in the steady progress of work.

Some shops are so well organized that the man in

(Continued on page 36)



drive a passenger car into the machine shop area.

An overhead crane which permits of movement of heavy parts a certain distance crossways of the building, in addition to the lengthwise movement of the ordinary monorail system, has been found advantageous in certain shops. If there is ample room so that trucks of various sizes can be spotted in such a manner that the engine always comes under the monorail system, there is no difficulty in removing engines. However, if space is limited and trucks cannot be placed in the most favorable position, it is an advantage to have an overhead crane with an amount of lateral travel, perhaps equal to the length of the trucks being serviced.

The management of traffic in and out of the service station is a problem in both large and small establishments. If there is only one door into which trucks are driven, it is necessary to so arrange work in the interior that any truck can be driven out of the shop as soon as work is finished. In case of establishments with only one door, however, if a large number of trucks are inside, the doorway is almost sure to be blocked. This has led to the building of two and sometimes three doors in shops so that trucks can be driven out without interference.

C. C. J. Shop Hints

Your idea in print will
return five dollars



Portable Body Hoist

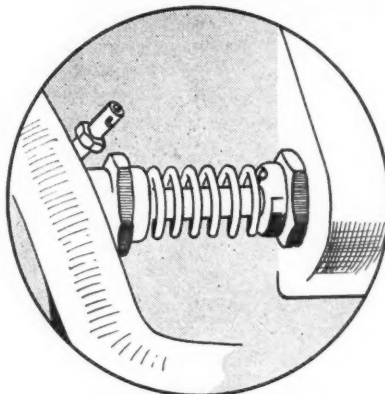
THE hand hoist shown in the illustration is used for raising and supporting one end of a body while work is being done. Due to the fact that the hoist is light and can be handled by one man it may be used for emergency work on the road or in the yard outside the shop. Miller Machine & Repair Shop, Denver, Colorado, use the hoist shown in the photograph.

It is made of two eight-foot sections of 3 x 4 hardwood, joined at the top by a V shaped strap of 2 in. by 1/4 strap iron on outer and inner face. Through these straps a bolt is passed which holds a 6 in. pulley in the top of the hoist. About 30 inches down from the top the frame is braced crosswise by a 1/4 in. by 2 in. strap. To this, and to the top of one of the legs a 2 by 4 is bolted, extending several inches above the top of the apparatus. This is to rest against the end of the body, while work is being done. A drum of 6 in. metal pipe, filled with wood, and with a 3/4 in. hole near each end, is fitted on a rod through the legs, just below the cross brace. A small wire cable fastened to this drum, and over the pulley at the top, has a double hook in the end for attaching to the bottom of the body. The drum is operated with an

iron rod at each end, which is inserted in the holes. When the body is raised one of these rods rests against one leg of the hoist, and holds the drum firm.

Emergency Pump Repair

A TEMPORARY repair of a water pump on which the threads of the packing nut were stripped was made by Martin A. Waline, Turlock, California.



A valve spring retains a pump packing nut in place after threads are stripped

On the engine in question it is necessary to remove the timing gear cover in order to install a new pump. With the threads stripped the packing could not be tightened and a tie-up of several hours was in prospect. The repair was made by using a section of a valve spring to force the packing nut against the pump body. The length of valve spring used must be adapted to the tension required and the amount of packing placed in the pump.

Carburetor Causes Coil Trouble

A TRUCK which repeatedly burned out ignition coils puzzled the owner and, in turn, his mechanic, a service station mechanic, ignition service station manager and finally truck branch service manager.

Tests of the whole electrical system failed to reveal any trouble of any kind. Substitution of coils and installation of new wiring brought no relief. Finally the truck service manager decided to ride on the truck during its daily route delivering bread at retail.

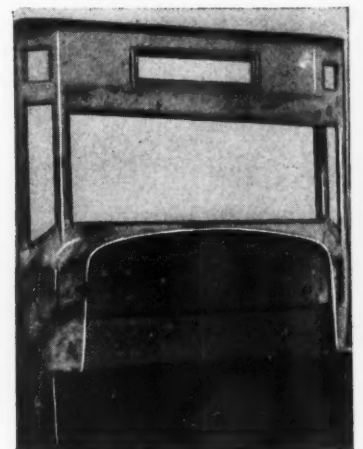
At the end of a few stops he had the answer.

A too-rich mixture of the carburetor when idling caused the engine to stop after two or three minutes running with the truck stationary. If the engine happened to stop with the distributor points open no damage was done but if the contacts were closed there was a continuous flow of currents through the coil until the driver returned to the truck after making calls at three or four homes. There was no resistance coil in the circuit to protect the ignition coil and after many repeated stops "on contact" the ignition coil gave out. Adjustment of the carburetor stopped the coil trouble.

Welding Aluminum Bus Cowl

A METHOD of welding aluminum cowl of buses by having one welder work inside and another outside at the same time is reported by Linde Air Products Co. Ordinary welding was tried by the fleet owner but it was found that the welds were too hard.

A successful weld was accomplished by having the two welders work at once and annealing the weld by rubbing it with a wet cloth. Alignment must be checked carefully during the progress of the work.



Two operators working at the same time welded this aluminum cowl



This body hoist is light enough to be moved about by one man

Successful Time Selling Demands Strong Collection System

*Liquidation of Weak Paper With Retention of Good-Will of Purchaser
Far More Important Than Original Acceptance of Risk*

FIRST of all, I recognize the value of time sales in our merchandising program. Developing the time sales method will, therefore, be the prerogative of my sales department and the financial department will only control the credit side of the time sales, and even then will be tempered by a considerable amount of sales psychology and sales practice.

In a word then, the sales manager of our factory will look upon time sales as one of his important aids. He will develop time sales throughout his organization as a definite factor and he will know what he wants and will demand it from the executive heads of his company. By way of contrast, I wonder how many of the automotive plants actually do put the control of time sales in the financial department instead of the sales department.

The real sales manager is going to adhere to the basic thought as to why he wants time sales. He wants them because he needs time selling to help him get his volume. Assuming that over 50 per cent of our future product is going to be sold on time, then over 50 per cent of his sales problem is invested in the subject of time sales and not cash sales or fleet sales. Here is what the sales manager is going to work out:

First, he is going to find out what percentage of the product is being sold on time, in the case of our own company and in the motor truck industry at large. If our percentage is 50 per cent and the industry's percentage is 70 per cent, then there is a 20 per cent increase in business somewhere for our company by building up our time sales to the normal. This does not mean turning cash sales into time sales. It merely means going out after our share of the available time business.

Secondly, perhaps we should have only one price schedule—a time price, and from that give a discount for cash. In other words, let's make our price fit the 70 per cent of our buyers and yet have an attractive discount basis for 30 per cent of our buyers. It is one of the strange peculiarities of the passenger car companies that although possibly two-thirds of the product is sold on time, they have not gone to the time price method with a discount for cash but still quote a price for the minority of their buyers and then have a tremendous sales resistance adding on something as an additional charge against the majority.

Judging by actual experience in merchandising motor buses, in that field the better method seems to be

By
R. G. Paine
Vice-president, Commercial Investment Trust, Inc.

to have a time price with a discount for cash, because actual experience so far as independent buyers are concerned has proved this to be a desirable way to present the product and the price.

The third merchandising point which our sales department will develop is the psychology of time sales. Our own field men and our branch managers and our sales force and our distributors and our dealers should all have continuous education in the value of time sales rather than the detriment of time sales. I think we all believe a great deal in psychology. Let us ask ourselves this fair question, "Does our present organization use our times sales plan to reach out for business, or merely to handle such business as may come in and ask for credit?"

We all know that in the past in the motor truck field time sales were used to a desperate degree to get business, but in getting business the proper way to sell on time was disregarded quite considerably. As a natural reaction from those days, it may well be that we ourselves and our organizations and dealers now have gone to the other extreme because of the unfortunate experiences several years ago.

Boiled down, how to sell properly and safely in order that the real profit in the deal can be realized rests on the following principles:

We all realize that our profit in a commodity sold on time is not earned until that commodity has been paid for by the purchaser. Perhaps there is a profit adjustment we should all make in that regard, as I feel sure many manufacturers consider their profit earned when the truck is delivered to the purchaser. I believe we should all feel that the entire profit is not earned until the final liquidation of the purchaser's account. On that account, it is to our best interest to see that we are able to collect from purchasers. Adopting the following safety principles will not curtail our aggressive time sales program.

First of all, whoever is selling time should collect as a time charge the cost of selling on time. Whether it be a dealer who is carrying on his own paper, or a factory who is operating through its own plan, or a factory using a finance company, the charge to the customer should be approximately the same. There are instances where some dealers and some factories sell on time at straight 6 per cent interest for the money

employed and they have their own time and overhead and their own risk which they are really, therefore, charging against

THE basic principles of time selling of trucks as viewed from the position of a manufacturing executive are the substance of this article. It is based on a paper recently delivered by Mr. Paine before the Motor Truck Division of the National Chamber of Commerce.

the profit they hope to make in the deal. In my analysis I feel that this is just a question of following the lines of least resistance. In the long run it will be just as easy to charge the fair and reasonable amount for time accommodation as it is now to give straight 6 per cent interest and absorb the additional cost out of the original profit.

This leads to a second credit point. In my theoretical position as a manufacturer of motor trucks, I offer the frank statement that I believe we manufacturers need a more uniform price control in our business. Isn't it a fact that our cash delivered prices vary throughout the country according to factors other than the freight? In many instances do not our branches or our dealers quote a price weighted with a special trade-in allowance to offset the inflated trade-in by the other fellow? Except in the very low-price lightweight trucks, is not the price situation rather uncertain? I think we all recognize this because many manufacturers today require a certain amount of down-payment in cash as well as the trade-in. When values are unstable because of this condition, then credits are more hazardous. It would be a wonderful thing I believe if motor truck prices, especially in the heavy-duty field, were established as time prices, not cash prices, but established so that everybody would know what they were supposed to be.

This same instability exists in the terms being offered as well as the prices, as I view the situation. If the salesman does not follow the line of least resistance, he will be able to sell the buyer on larger down payments and quick liquidation of debt, which will insure more of our profits remaining with us.

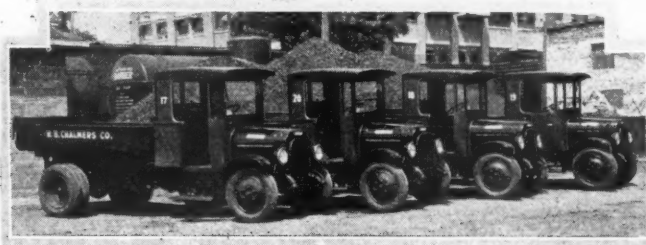
My third suggestion is in reference to fleet sales which credit men and finance men call "jumbo sales." There are many reasons why fleet sales are extra profitable to the manufacturer or the seller, and yet from the credit standpoint there are many reasons why fleet sales are the most dangerous. If the purchaser falls down on his obligation, it may mean 10 trucks repossessed instead of one. It may mean 10 losses instead of one. It may mean destroying the whole used truck price level in a given community. One of the credit principles in selling fleets on time, where the fleet amounts to more than two or three units, is to have something behind the paper besides the hope of the purchaser that he will earn enough with the trucks to pay for them. In many cases, purchasers will apply this additional protection if some constructive credit man talks to them and finds out what their situation really is.

It is because of this peculiar dual situation, that while a fleet is doubly profitable to the seller it is doubly dangerous from his credit standpoint, that I make my final suggestion.

The manufacturer who is selling on time or the dealer or distributor, as the case may be, should have the services of the most constructive credit man that he can obtain. Passing the credits on time sales is not a job to be wished off on some bookkeeper in the office, but it is one of the most important tasks in the organization, as it controls the selling at the same time that it controls the losses. Here again, just as I suggested in the beginning, time sales for the merchandising value should be turned over to the sales department. I suggest that time sales from the credit standpoint be turned over to a real live credit man who not only knows credit but has enough of the new business slant to perform his job intelligently and in relation to the sales problem.

Most important of all, however, the collection of the time sale from the purchaser and the safeguard of the profit of the manufacturer or seller is the creation and maintenance of a strong and experienced collection efficiency.

In my conclusion and in dwelling on this point a moment, I wish to assume my real position as an executive of a leading finance company. The experience of finance companies proves that a strong collection department is 90 per cent of keeping time sales safe. We ourselves have purchased paper created under extraordinarily weak credit conditions, but by use of a strong and efficient collection force we



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One of the credit principles in selling fleets on time where the fleet amounts to more than two or three units, is to have something behind the paper besides the hope of the purchaser that he will earn enough with the trucks to pay for them.

have liquidated the paper with a very small loss and at the same time have retained for the dealers the good-will of their purchasers. This is where experience in collection comes in. As against having the best and most constructive credit man in the world and a weak collection department, I would prefer to have the weakest credit man in existence and the strong collection department. By strong I don't mean strong-armed, but I mean an experienced organization that knows how to sell purchasers on making payments and keeping their commodity in their own hands and not just a man who goes out and—"Well, either pay this money or give me the car." Purchasers have got to be sold on keeping their cars and sold on being willing to pay as often as they are originally sold on taking the car in the first place. Time sales are one of the liveliest sales assets of any organization. Make use of time sales to build for more business.

New Trucks of the Month

I. H. C.

THREE new truck models, having a capacity range of $2\frac{1}{2}$, $3\frac{1}{2}$ and 5 tons and furnished with either double reduction gear or chain drive rears in the two lighter models, have just been added to the line of the International Harvester Co. Drive of the 5-ton model is by chain only. This new line, powered by four-cylinder, overhead valve and camshaft engines, is equipped with five-speed transmissions and mechanically operated internal four-wheel brakes. With the exception of the engines all other chassis units throughout this new line are identical in design, construction and materials, differing only in size. The line is designated as follows: Model HS-54, $2\frac{1}{2}$ ton; HS-74, $3\frac{1}{2}$ ton; and HS-104, 5 ton. The addition of the letter "C" to the Model designations denotes chain drive.

The powerplants used in these trucks are Hall-Scott models 151 and 152. Model 151, used in the $2\frac{1}{2}$ ton trucks, has a bore and stroke of $4\frac{1}{4} \times 5\frac{1}{2}$ in., developing its maximum, 53.5 brake horsepower at 1800 r.p.m. and its maximum torque, 195 lb. ft. at 1000 r.p.m. Piston displacement is 312 cu. in. and compression ratio is 4.03 to 1.

Model 152, $4\frac{1}{4}$ bore and $5\frac{1}{2}$ stroke, is used in the $3\frac{1}{2}$ and 5-ton trucks. Its maximum brake horsepower of 60 is developed at 1800 and torque of 224 lb.-ft. at 1000 r.p.m. Piston displacement is 390 cu. in. and compression ratio 3.86 to 1.

The camshafts, valves and valve mechanisms of these engines are carried on removable cylinder heads. Each cam on the overhead camshaft actuates two rocker arms, and they in turn the valves. Timing and accessory drive is by silent chain over a four-sprocket train. Chain adjustment is obtained by rotation of eccentrically mounted water pump and bracket. Aluminum alloy pistons of a patented type and with no metal struts are used. They are fitted with six rings, five of which are above the wrist pins. Three of these uppers are $\frac{1}{8}$ -in. compression rings, while the other two are oil wipers. The lower ring is also a wiper but of $\frac{3}{16}$ in. width.

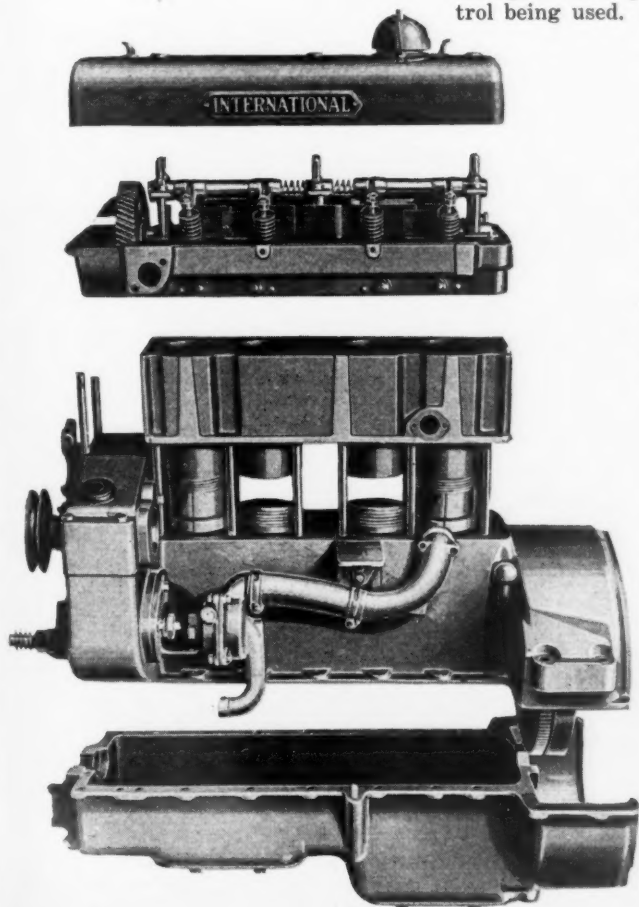
Lubrication is force-feed through drilled passages by a gear type pump built in the front of the lower crankcase and driven direct by a helical gear on the crankshaft. Felt disk, cartridge type oil filters are standard equipment.

The cooling system includes a cast shell, tubular type radiator and centrifugal water pump, thermostat control being used.

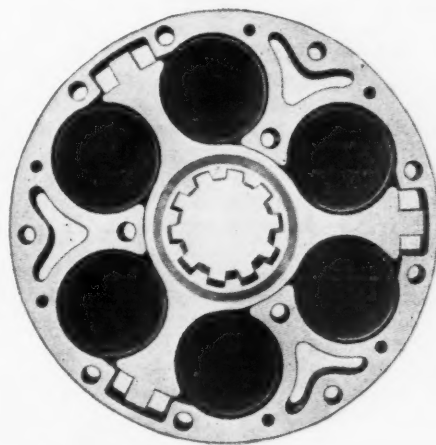
A vibration damper is a feature of the clutch, which is of the single dry plate type. This damper consists of a cage riveted to the driven disk with six cylindrical rubber cushions and a three-legged spider floated inside. Ventilating openings in the six sectors of the driven disk control expansion. A 12-in. clutch is used in the $2\frac{1}{2}$ -ton truck while 14-in. sizes are used in the heavier models.

The five-speed transmission is mounted in unit with the clutch and engine. Shifting mechanism is controlled by two levers, the auxiliary or two-range lever mounted immediately in front of the regular shifter. Low range consists of first with ratio of 8.83 to 1 and second with ratio of 5.13 to 1, high range of third and fourth with respective ratios of 3.19 to 1 and 1.86 to 1 while fifth, which is the high speed, is direct. Ball bearings and chrome-nickel steels are used throughout. Power take-off apertures are provided on both sides of the transmission cases, while the speedometer take-off is built into the rear main bearing cage.

Propeller shafts are of heat-treated seamless steel tubing equipped with universals of the two-yoke, four-trunnion spider type. The spider bodies form lubricant reservoirs for centrifugal lubrication of the trunnions. Steering is by the patented International steer-



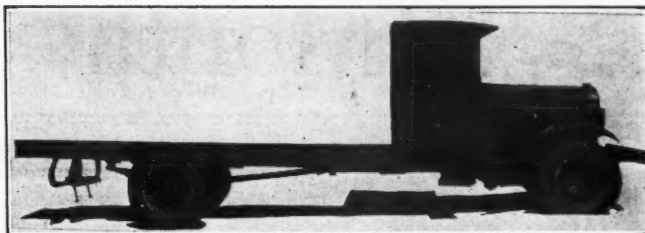
Left: Hall-Scott four-cylinder engine as used on new International Harvester trucks



Right: Vibration damper which is riveted to clutch disk

Below: New International Harvester truck with chain final drive





Hug's new two-ton express model. It is powered by a six and equipped with four-speed transmission and four-wheel brakes

ing gear with safety type drag link. This gear is of the worm and wheel, semi-irreversible type.

First reduction in the double reduction rear axles is through a spiral bevel gear and the second is through herringbone gears. Heavy-duty, double row ball bearings are used throughout with opposed tapered roller bearings at the wheels. The differential is removable as a unit from the front of the housing, which carries a large inspection opening at the rear. No radius rods are used. The rear axle ratios for the 2½ and 3½-ton trucks are 6.85 to 1 and 7.85 to 1, respectively.

Various combinations of drive and driven sprockets are available for the chain driven trucks. Standard ratios for 2½, 3½ and 5-ton trucks are: 7.22 to 1; 8.81 to 1 and 10.08 to 1. The live axle assembly is carried in the frame by a cast steel housing with large inspection cover at rear. Heavy-duty tapered roller bearings and chrome-nickel steel shafts are used. The driven sprockets are independent of brake drums. Drop-forged radius rods with sliding-wedge length adjustments are used.

The frames are pressed steel of 7 and 8-in. section for the 2½-ton and heavier models, respectively. Both channel and tubular cross-members are used. To provide an extra margin of safety for the chain-driven models, inserted channel reinforcements extend from the front spring rear hanger to the rear end. Towing eyes on both sides at front and in center of rear cross-member are standard equipment.

All springs, both front and rear, are semi-elliptic equipped with bronze-bushed eyes and rebound clips. Auxiliary springs on the double reduction models are of inverted quarter elliptic type, while those on the chain-driven models are of semi-elliptic form mounted above and parallel to the main spring and with both ends free.

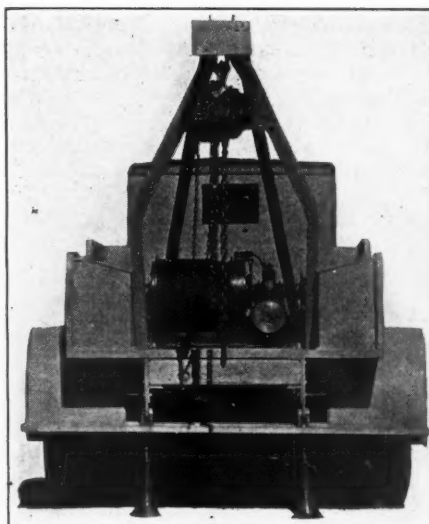
The control linkage of the four-wheel brake system is such that in event any rod or connection becomes inoperative and affects the braking action on one wheel, the remaining three wheels continue under control. No equalizers, of course, are used. The front wheel brakes on all models are of the three-shoe, self-energizing type, and are mechanically actuated in series with the rear wheel brakes. The internal rear wheel brakes vary with the type of drive. On the double reduction models the rear wheel brakes are of the semi-floating type and are actuated by cams of square section. The rear brakes on the chain-driven models are of the full-

floating band type servo-energized and self-locating in the drums. Total brake surface areas for the various models are HS-54, 726 sq. in.; HS-54-C, 732 sq. in.; HS-74, 850 sq. in.; HS-74-C and HS-104-C, 736 sq. in.

Hug

PRODUCTION of a new 2-ton truck has been announced by the Hug Co., Highland, Ill. This new unit, designated as the Hug Model 22 Express Flyer, is equipped with a six-cylinder, 3½ x 4½ engine, four-speed transmission, four-wheel internal hydraulic brakes and a single reduction axle. It is furnished in 160, 175 and 185-in. wheelbase lengths and governed to a maximum road speed of 40 m.p.h.

The powerplant, a Buda Model HS6A,



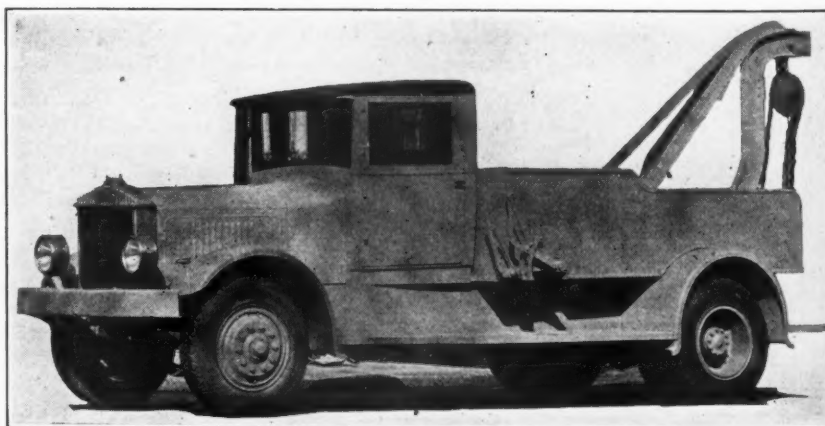
is equipped with a built-in governor and oil filter. An oil pump driven from the camshaft delivers force feed lubrication to all crankshaft, camshaft and connecting rod bearings through a seamless steel distributing pipe cast in the crankcase. Ignition is by distributor and coil while carburetion is by vacuum from a 20-gal. tank to a 1¼-in. carburetor equipped with choke valve and hot air stove. The cooling system includes an oval tubular type radiator, having a core depth of 3 in., centrifugal pump and aluminum cast radiator shell.

The multiple dry disk clutch and four-speed gearset are mounted in unit with the engine. From the transmission power is carried to the rear axle through a two-piece, 2¼-in. tubular shaft supported by an oil-tight, self-aligning bearing and equipped with all-metal universal joints. Final drive is through a single reduction, semi-floating spiral bevel gear rear axle. It is furnished with dual wheel bearings and the pinion gear is carried between two ball bearings in straddle mounting. Steering is by Ross gear of the cam and lever type.

The Lockheed hydraulic brakes act on 16 x 2¼ in. drums front and rear. The emergency or parking brake is of the ventilated disk type acting on a 12-in. diameter disk mounted on the propeller shaft. The frame, heat-treated steel, is suspended on four semi-elliptic alloy steel springs, 2 in. wide in the front and 3 in. wide in the rear. A bumper is mounted integral with the frame at the front. Wheels are metal equipped with demountable rims and 32 x 6 in. pneumatics in front and 34 x 7 in. single in the rear.

Standard equipment includes ammeter, oil pressure gage, spare rim and tire carrier.

Dual wheel equipment for the Rugby Express one-ton, six-cylinder model can be obtained from the Dayton Steel Foundry Company. This equipment lists at \$40 per wheel, less rims and brake drum. The brake drum is transferred from the original wheel to the dual wheel.



Views of the special wrecker brought out by the Standard Truck Co. It is equipped with a six-cylinder Continental, nine-speed Brown-Lipe transmission and four-wheel brakes

Chevrolet Six

SIX-CYLINDER engines will be used in the 1929 Chevrolet line, according to a statement issued by the factory. Delivery to purchasers will start about January 1.

While the engine, which is still of the valve-in-head type, is completely new, much of the chassis otherwise remains unchanged, refined here and there, strengthened in points to conform with the higher engine power, but in basic design continuing that of the previous model.

Prices, as in the case of the passenger car models, are practically unchanged over those of the previous series. The light delivery chassis is \$5 higher at \$400, while the new 1½-ton model lists at \$545 as against \$495 for the old 1-ton model. Equipped with cab the 1½-ton chassis lists at \$650. A sedan delivery model, a new addition to the truck line, is priced at \$595.

The new Chevrolet six-cylinder engine can properly be designated as a low-speed engine, as engine speeds run at present. The speed at which the maximum of 46 hp. is developed is not announced, but since the engine has a displacement of 194 cu. in. with its bore and stroke of 3 5/16 x 3 3/4 in. it should provide low-speed accelerating characteristics and minimum engine vibration at high-road speeds.

Both the crankshaft, which weighs 46 lb., and the camshaft are carried in three bearings with the following dimensions:

Crankshaft		
	Diameter	Length
Front	1 1/8	1 3/4
Center	2	2
Rear	2 1/8	2 3/8
Crankpin	2	1 3/8
Camshaft		
	Diameter	Length
Front	1 1/8	1 1/8
Center	1 3/8	1 1/4
Rear	1 5/8	1 1/8

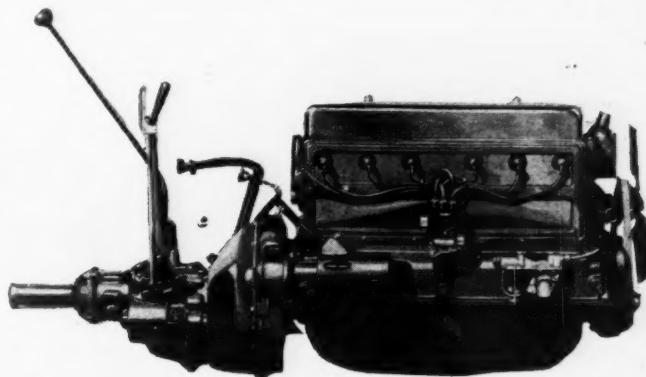
Connecting rods are 8 3/4 in. between centers and are provided with splash dipper at the lower ends. Piston pins are locked in the upper ends of the rods and float directly in the cast iron pistons. The latter are fitted with three rings each, two 5/32 in. compression and one 5/32 in. oil ring. Piston pins are one inch in diameter and 2 15/16 in. long.

An offset type of combustion chamber design has been worked out for the new engine. Spark plugs are located at the extreme left of the chamber and in a pocket somewhat above the main chamber. To reduce detonation tendency and improve general efficiency of the engine valves are located directly over the piston and the combustion chamber is extended only to within slightly more than 1/2 in. of the cylinder bore on the side opposite to the spark plugs, leaving a "low clearance" space at this end. An interesting feature of the head is the ample waterjacketing around both spark plugs and valves.

Valve operation is similar to that used in the previous four-cylinder

model with push rods transferring the valve lift from the camshaft to the rocker arms. Valves are 1 13/32 in. diameter and have an overall length of 4 1/4 in. Stem diameter is 5/16 in. An improvement is noted which should aid in quieting the valve mechanism in the wick feed lubrication for the

Chevrolet's new six-cylinder engine mounted in unit with the clutch and transmission. It has a bore and stroke of 3 5/16 x 3 3/4 in. and develops 46 hp.



push rods and direct oil feed to the completely enclosed rocker arm shaft.

Lubrication is by a combination splash and gravity feed system. A pump delivers the oil under pressure to the oil distributor which in turn delivers it to pockets above the main and camshaft bearings. Standpipes are provided in the main bearing mounting bosses to prevent sediment and foreign matter entering the bearing. Connecting rods are lubricated by dip, the splash also serving for piston pin and piston lubrication.

A vane type pump has been developed for the lubricating system. It is located in the lower crankcase and is driven by a short inclined shaft from the camshaft. The upper end of this shaft, pinned to the pump drive shaft, drives the ignition distributor located at the left of the cylinder block. The ignition distributor is provided with an external spark advance adjustment. This unit as well as the starter and generator are Delco-Remy.

Inlet and exhaust manifolds are of the three and four-port types respectively with a heat interchange jacket for the inlet riser. There is an accelerating pump and AC air cleaner mounted on the Carter carburetor. An A-C fuel pump has been adopted as standard and, as usual, is driven off the camshaft by a separate eccentric. An 11-gallon tank is provided at the rear of the chassis. A gasoline strainer is also included as standard.

Newness in style is provided chiefly by the new molding treatment and front end of the vehicle, with their flat hood, Hispano type radiator shell and false pan front between the front spring horns. Wheelbase and overall dimensions remain unchanged.

A Harrison cellular radiator and integral water pump and two-bladed fan driven by a V-type belt at the front end of the cylinder block form the major units of the cooling system. The belt also drives the generator, which serves for adjusting the belt.

Driving units are of the same general design as formerly, with better steel

for the transmission gears and a heavier rear axle. The latter has a banjo type one-piece housing with an oil deflector inside the inspection cover.

The four-wheel brakes developed for the 1928 models are continued with drum diameters of 10 1/2 in. for the front and 11 in. for the rear, lining

being 2 in. wide at the rear and 1 1/2 in. at the front, the latter being internal and the former external brakes. Steel disk wheels are standard on all models, carrying 4.50/20 balloon tires. Steering gear is of the worm and gear type with the worm shaft mounted on ball bearings.

Springs are unchanged in length and width, and the shock absorbing rebound control leaf is continued. Spark and throttle controls are located on the dash. Instrument panels are indirectly lighted. Head lamp rims and radiator shell are chrome plated.

Standard

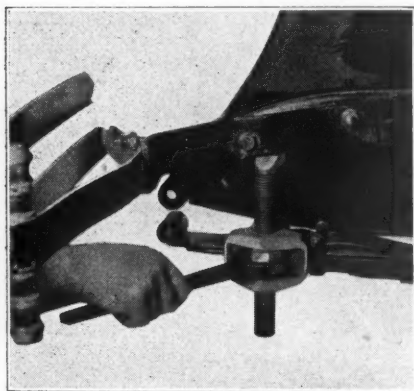
THE Standard Motor Truck Co., Detroit, recently built a special wrecker for the Detroit Fire Department to meet emergency service demands of fire fighting equipment. Its primary work is to be able at a moment's notice to go anywhere to assist in towing or repairing disabled fire apparatus. This wrecker is powered with a Continental 15-H six-cylinder, 4 1/2 x 5 1/4 in. engine. Dual ignition is provided, battery and magneto, with two spark plugs to each cylinder. A nine-speed Brown-Lipe transmission is employed, permitting a road speed of 45 to 50 m.p.h. in high gear. Final drive is through a Timken worm drive rear axle and braking is provided by four-wheel Bendix equipment. Budd steel disk wheels equipped with 36 x 8 in. pneumatics, all around, dual rears, are standard.

The wrecker is equipped with a 10,000 lb. Bay City winch and a heavy duty ball bearing chain fall. Winch control levers are located on the side of the body. For operating in a still position or where soft ground is encountered, special rear end removable jacks are available, being carried on the job as part of its equipment. The unit is further equipped with a closed cab and a body specially designed with all necessary tool boxes and space for equipment to be carried.

Jack for Spring Jobs

Thompson Products, Inc.
Cleveland, Ohio

KNOwn as the Handy Jack, this tool recently introduced by the above company is designed to speed up the replacement of shackle bolts and bushings at both ends of front and rear springs and to serve in other applications in chassis repair and maintenance work. The tool consists of a movable jaw with a 1-in. diameter threaded shank, passing through a base jaw. In applying the tool, one jaw is set against the spring and the other against the spring arm or chassis frame. The spring is then spread by turning a



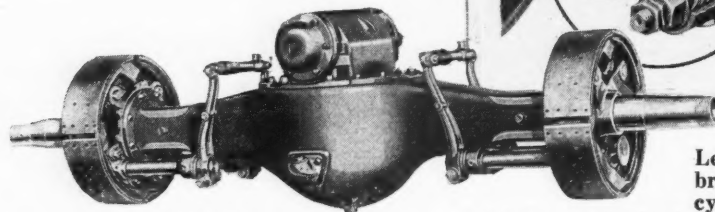
1 11/16-in. hex nut set into the recessed jaw. Any adjustable-type or open-end wrench operates the jack. Jaws are knurled at points of contact and movable jaw is recessed for rivet heads on spring arms. The tool may also be used as a frame straightener or spreader when used with a section of tubing or pipe to gain the required width; as a vise for holding spring leaves when putting in center bolts; as a tool for pressing bushings into steering knuckles or into the axle when the bushings are so located. The jack will be sold through distributors handling Thompson bolts and bushings.

Lycoming Redesigns T Series

Lycoming Mfg. Co.
Williamsport, Pa.

USE of a counterbalanced crankshaft is one of the outstanding features of the new T series Lycoming engine. The T series which is rated at 10 per cent greater horsepower than the former series, is comprised of six-cylinder models TF 3 3/4 x 5 in. and TS 3 3/4 x 5 in. which are used for truck and bus work.

The method of counterbalancing used by Lycoming is unique in that all the counterweights are forged integral with the crankshaft, except one, which is securely fastened to a large flange with four nickel steel screws, welded to prevent any possibility of working loose.



The method of retaining the piston pin in the piston has been changed from a lock screw to a floating type construction, the piston pin being retained by use of snap rings in grooves in the piston.

The side walls of the crankcase have been increased, heavier ribs have been added from the main bearings to the bottom flange, and the width and thickness of the oil pan flange has been increased. The cylinder studs have been increased from one-half to nine-sixteenth inches and the water passages in the cylinder block, particularly around the valves, have been enlarged. This change lowers the working temperature of the valve head and eliminates any tendency of the seat to warp, as well as improving the volumetric efficiency of the engine.

Graphite Seal

Joseph Dixon Crucible Co.
Jersey City, N. J.

THIS new addition to the above company's line of graphite products is a graphite paste recommended in place of shellac for all gaskets, for making joints in oil and gasoline lines, for sealing screw threads, etc. It is insoluble in oils and gasoline and is stated to expand when subjected to heat, making for leak-proof joints under all conditions of service.

Timken Duplex Hydraulic Brake

Timken-Detroit Axle Co.
Detroit, Mich.

TIMKEN Duplex brakes which have been used with mechanical hook-up on Timken axles for some years are now offered with hydraulic operation. The new system comprises operating cylinders mounted at the ends of the brake levers, rather than in the wheels, a worm-type slack adjuster to compensate for lining wear and

a master cylinder and piping. The system is applicable to front wheel brakes as well as rear brakes. The four-wheel brake system is used in the new type W Yellow bus, with Cadillac engine, recently introduced.

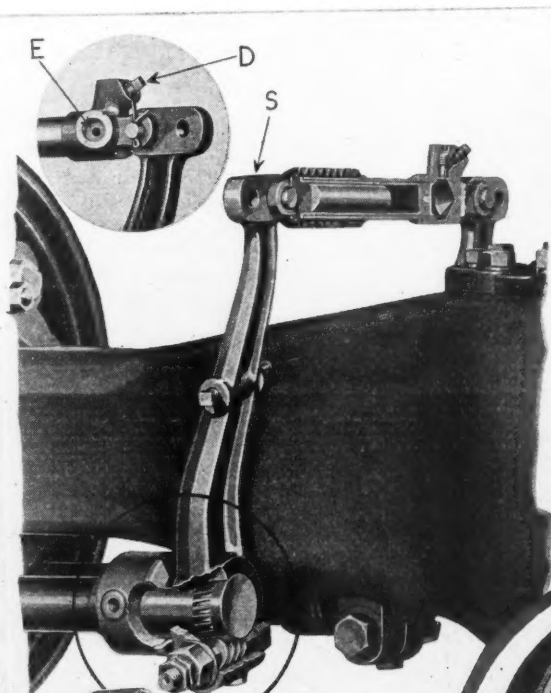
Two pairs of shoes expanding against a single drum comprise the Timken Duplex brake construction. Each pair of shoes is actuated by a separate cam, camshaft and lever. One of the levers is forward of the axle and the other is to the rear of this member. One pair of shoes in each wheel may be used for service braking and the other for emergency, or hand lever, operation. However, in the hydraulic hook-up both pairs of shoes are operated together for service brakes.

The brake operating cylinder is mounted between the eyes of the two brake levers, as shown in Fig. 1, and it may be removed by taking out two clevis pins and disconnecting the hose. The cylinder has a rubber piston cup and a long tubular piston. The clevis which attaches to the lever opposite the head of the piston has a long stem which slides in the piston and has a shoulder against which the piston acts. This construction permits the clevis to slide outward without affecting the hydraulic system, the latter action taking place when the brake is applied mechanically, if desired for parking.

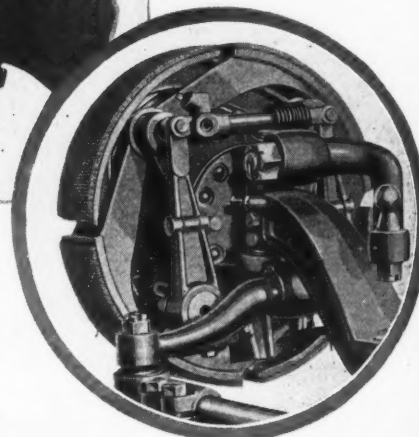
The slack-adjuster assembly is placed at the end of the brake lever at point of attachment to the brake camshaft. An integral worm wheel is machined in the end of the brake camshaft and a worm is mounted in the end of the lever. Position of the worm is locked by a clamp nut, as shown in Fig. 2.

The Timken-Detroit Axle Co., manufactures the entire brake mechanism together with brake operating cylinder. The balance of the system including master cylinder and piping is obtained from the Hydraulic Brake Co., Detroit, Mich.

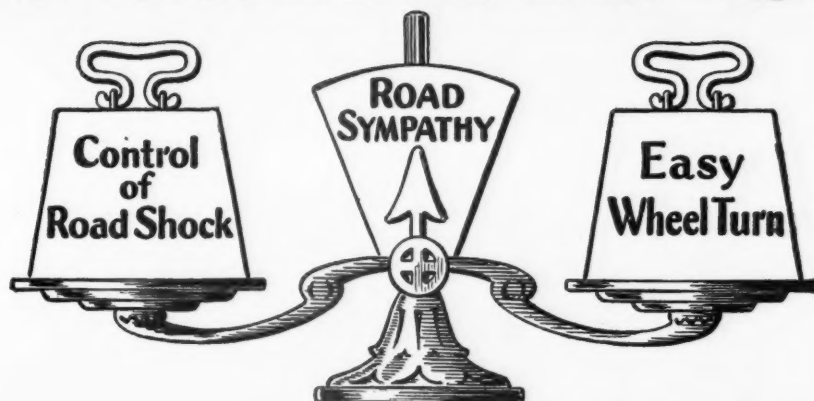
The front brake mechanism, used with four-wheel brake equipment, is practically identical with that on the rear axle. The camshafts are somewhat shorter in order that the brake levers may be close to the wheel and permit the brake operating cylinder to pass over the front axle steering knuckle. The operating cylinder is mounted between the brake levers, as with the rear axle construction.



Left: Fig. 1—The brake operating cylinders are placed between the brake levers, not in the wheels. Above: Fig. 2—Worm type slack adjuster at end of camshaft. Hose is attached at E, bleeder valve is at D, mechanical hand brake may be attached at S. Right: Front assembly



BALANCE



The Test of Good Steering

WHEN balance is achieved in a steering gear, good steering is achieved—and not before!... It would be a simple matter to build a steering gear with such ease of wheel turn that practically all effort would be removed from steering—yet nothing would be more unsatisfactory, for all road-sympathy would be lost.

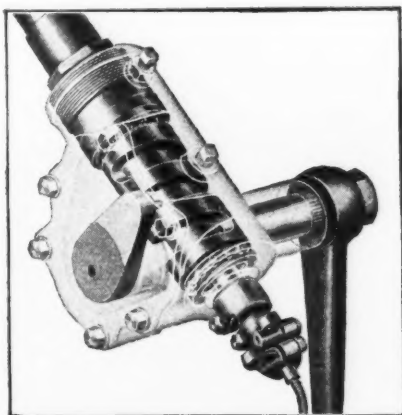
By the same token, a steering gear could be built to be *absolutely irreversible*, effectively stopping all road-shock—yet, again road-sympathy would be sacrificed.

It is the nice balance of three basic qualities—their proper proportioning—which makes for good steering. And in the Ross Cam and Lever Steering Gear, by a combination of mechanical advantages found in no other gear—we believe that we have achieved

- a greater degree of easy wheel turn
- a greater degree of road-shock control
- a greater degree of road-sympathy

How this has been achieved—all in one steering gear—constitutes an interesting story of well-directed research and development. It is a story which will enable you to understand why Ross is the preferred steering gear for passenger cars, trucks and buses. Let us present it.

ROSS GEAR & TOOL COMPANY, Lafayette, Indiana



The balanced qualities of Ross Steering are largely the result of these features in which the Ross Cam and Lever Steering Gear differs from the conventional type of steering gear:

- Variable Ratio of Cam
- Line Contact Between Actuated and Actuating Members
- Low Internal Pressures
- Powerful Internal Leverage

ROSS *Cam AND Lever* STEERING

Two New Wisconsin Sixes

Wisconsin Motor Company,
Milwaukee, Wis.

TWO new six-cylinder valve-in-head engines for trucks and buses have just been announced by the Wisconsin Motor Company of Milwaukee. In connection with the introduction of the two new jobs, the company also announces changes in the Model N engine which have materially increased the horsepower and efficiency.

The larger of the two new engines is the Model "G," which has a bore and stroke of $3\frac{1}{2} \times 5$ in., giving a piston displacement of 309 cu. in. and developing an estimated 65 hp. at 2050 r.p.m. Maximum torque is estimated at 205 lb.-ft. at 575 r.p.m.

Type "F," the second of the two new engines, has a bore and stroke of $3\frac{1}{4} \times 4\frac{1}{4}$ in., with a piston displacement of 212 cu. in. This engine develops 45 b.hp. at 2000 r.p.m. and its maximum torque is 142 lb.-ft. at 800 r.p.m. Cylinders and crankcase of both the Model "F" and "G" are cast integrally and the crankcase is heavily ribbed to carry the bearings.

Cylinder heads are cast of close grained iron, in one piece, and carry the valves, rocker shafts and rocker levers. The valves are located vertically in the head with 45 deg. seats and $\frac{3}{8}$ in. lift. Exhaust valves are of chrome silicon steel and inlet valve material is chrome nickel steel. The Model "G" engine valves are $1\frac{11}{16}$ in. outside diameter and $1\frac{1}{2}$ in. clear diameter. Model "F" valve sizes are $1\frac{15}{32}$ and $1\frac{15}{16}$ in. in respective diameters.

Both engines have timing gear covers of cast iron, which carry the front engine trunnion supports, which are $3\frac{3}{4}$ in. in diameter. The front trunnion bracket has a drop of $2\frac{1}{2}$ in. and is drilled for two $\frac{1}{2}$ in. bolts, $5\frac{3}{8}$ in. from center to center.

No. 3, S.A.E. standard flywheel housings are used, made of cast iron and bolted to the rear of the crankcase. Rear engine support arms are drilled for $\frac{5}{8}$ in. bolts, $24\frac{1}{2}$ in. from center to center and the drop from the supporting arm to the center line of the crankshaft is $2\frac{1}{2}$ in.

The crankshaft is carried on four main bearings, $2\frac{1}{2}$ in. in diameter on the Model "G" and 2 in. in diameter on the Model "F." Bearing lengths on the Model "G" are $2\frac{1}{2}$ in. front, $2\frac{1}{4}$ in. both centers, and 3 in. rear; Model "F" $2\frac{1}{4}$ in. front, $1\frac{3}{4}$ in. both centers, and $2\frac{3}{4}$ in. rear. The crankshaft is drop forged of 45 per cent carbon steel, double heat-treated and is statically and dynamically balanced.

Connecting rods on the Model "G" are

made of 35 per cent carbon steel, I-section, $10\frac{1}{2}$ in. long from center to center, slightly more than twice the stroke. The lower bearing is $2\frac{1}{2}$ in. in diameter and $1\frac{3}{4}$ in. long. Piston pins are $1\frac{1}{16}$ in. in diameter and the $1\frac{7}{16}$ in. bushing is carried in the upper end of the rod. Model "F" connecting rods are different only in the dimensions. They are $8\frac{1}{2}$ in. long, the lower bearing has a diameter of 2 in., length of $1\frac{1}{2}$ in.; the wrist pin is $1\frac{15}{16}$ in. in diameter and the bushing is $1\frac{3}{8}$ in. long.

Cast gray iron pistons are used in the new engines, 4 in. long in the Model "G" and $3\frac{3}{4}$ in. long in the Model "F." Pistons in both models are fitted with three rings, $\frac{1}{8}$ and $\frac{3}{16}$ in. wide respectively, the lower ring in each engine model being of the oil regulator type.

Valve tappets are of the mushroom type, detachable in sets of four and mounted on plates bolted to the right side of the crankcase. The camshaft in both engines is mounted on four bearings, and is a steel drop forging, with the cams, bearings and flange for timing gear forged integrally.

Both main and camshaft bearings are bronze-backed and babbitt lined. The connecting rod bearings are die cast in the rod. Bronze bushings are used in the upper end of the rod. Timing gears have helical teeth with $1\frac{1}{4}$ in. and 1 in. faces on the Model "G" and Model "F" respectively. Crankshaft and generator gears are of steel, while the timing gear, bolted to the camshaft flange, is supplied either in Formica or Celoron.

Flywheels of both engines have 126 teeth, 8-10 pitch, cut directly in the flywheel rim for the starting motor. The flywheel is bolted to the crankshaft flange by six $\frac{1}{2}$ in. bolts.

Water pump and fan combination is mounted on the front of the cylinder block, driven by a $\frac{3}{4}$ in. round belt. The units are supported on a stud, on which they may be swung for adjustment. The fan is 18 in. in diameter, the upper pulley is $4\frac{1}{2}$ in. in diameter, while the lower has a diameter of 6 in. Water inlet pipe has a diameter of $1\frac{1}{4}$ in., while the water outlet pipe on the cylinder head is $1\frac{1}{2}$ in. in diameter on both models.

Oil pumps are of the gear type, driven from the rear end of the camshaft by helical gear. A large removable fine-mesh strainer is attached to the bottom of the pressed steel oil pan, and an oil header extends the full length of the crankcase, connecting with the main bearings. The crankshaft is drilled from main bearings to crank

pins and an oil lead is provided to the hollow overhead rocker shaft and another to the timing gears. Pistons, tappets and camshaft are lubricated by splash.

Oil pressure is 30 to 40 lb. at normal speeds, maintained by an adjustable pressure regulating valve attached to the outside of the crankcase. The regulating valve also is equipped with a fitting for connection to the dash oil gage. The oil filler is cast on the front gear cover and fitted with a hinged cap. A bayonet type oil gage is fitted to the right side of the engine and provision also can be made for mounting an oil cleaner.

Exhaust manifolds on both models are made to take an exhaust pipe of $2\frac{1}{4}$ in. outside diameter, with outlet at the front end of the engine on the left side. A hot air stove with summer and winter regulator is cast integrally with the manifold, and provision is made for mounting an air cleaner on the stove. A hot spot also is provided at the center for the intake manifold. Model "G" takes $1\frac{1}{2}$ in. carburetor and the Model "F" takes a 1 in. type.

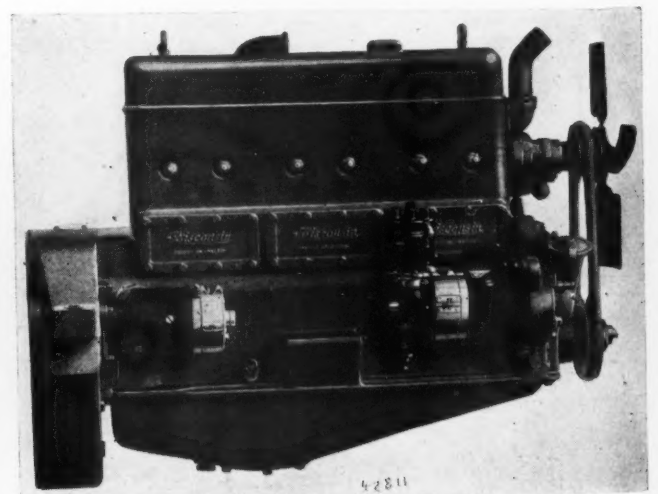
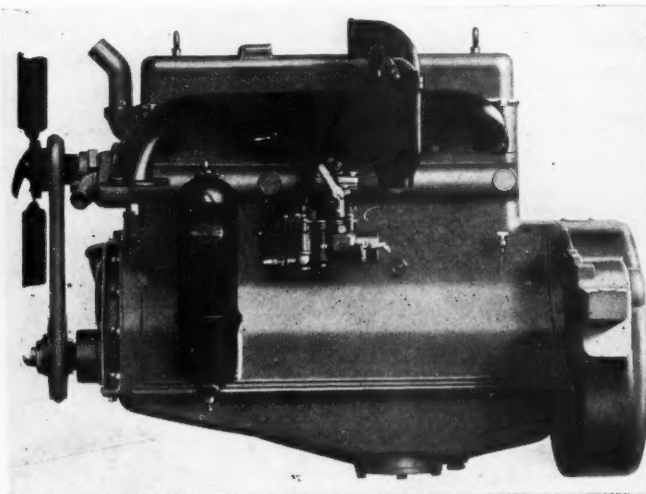
A suction type governor is recommended for both models.

A generator with a No. 2 S.A.E. flange may be mounted on the right side of the engine at the rear of the front end case. It is driven at $1\frac{1}{2}$ times engine speed, clockwise. The generator is to be provided with a through shaft for driving the magneto. The starting motor, with No. 1 S.A.E. flange may be mounted at either side of the flywheel housing. It is fitted with an 11-tooth pinion, 8-10 pitch.

A standard magneto base is provided on the right side of the engine and provision is made for carrying a magneto control rocker shaft through the crankcase. Firing order of both engines is 1-4-2-6-3-5. The timing lever is on the right side when viewed from the driving shaft end. The magneto is driven from the rear of the generator shaft and rotates clockwise. The timer, if desired, is to be mounted on the generator.

Spark plugs are $\frac{7}{8}$ in.—18 S.A.E. thread, with $\frac{7}{8}$ or $15/16$ hex and 1 in. long skirt, located in the right side of the cylinder head on the same side as the magneto.

Improvements in the Model "N" engine are confined principally to enlargement of the bore $\frac{1}{8}$ in. to $3\frac{1}{2}$ in. Stroke remains at $4\frac{1}{4}$ in. Piston displacement is thus raised from 228 cu. in. to 245 cu. in. and brake horsepower is increased from 50 at 2200 r.p.m. to 55 at 2600 r.p.m. Torque reaches a maximum of 163 ft. lb. at 650 r.p.m.



Left—View representative of Models F, N and G Wisconsin engines, showing carburetor side.
Right—Model F engine, magneto side



1 Ton
6 Cylinder
4 Wheel Brakes
\$995 Chassis

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are the outstanding value of truckdom

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Stewart owners do not figure depreciation on a 2 or 3 year basis. They know by experience that the average life of a Stewart is 5 years or more. Many Stewarts have given their owners 8, 10 and 12 years of continuous service.

Stewart Sales Are Increasing

Stewart sales in 1926 were 41% greater than in 1925 and in 1927 44% over 1926. Sales for 1928 to date are 48% over 1927. These figures represent world wide recognition of Stewart value.

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Worm Axle . . .	\$2095 Chassis	
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3 Ton		
6 Cylinder . . .	\$3490 Chassis	
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6 Cylinder . . .	\$4200 Chassis	

All prices f.o.b. Buffalo

Stewart

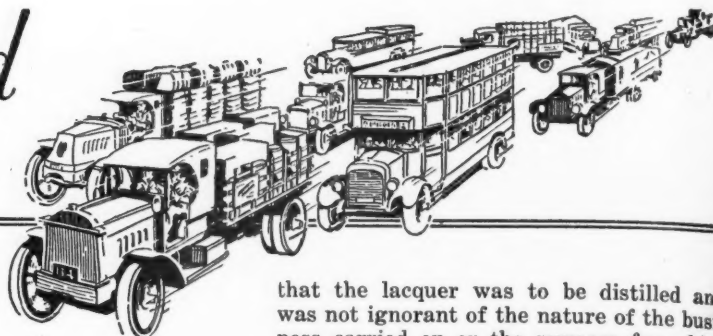
MOTOR TRUCKS



3 Ton
6 Cylinder
4 Wheel Brakes
Pneumatic Tires Extra
\$3490 Chassis

Stewart Trucks have won—By costing less to run

Have You Heard That ~



WITH but few exceptions reports from business centers through the country are very encouraging and point to continued improvement in sales and general business conditions. Atlanta reports that business continues brisk in both light and heavy duty lines in nearly all vocations. October showed a gain over last October, 1927, and sales during the last 10 months show a healthy gain over the same period last year. Healthy business generally in the Cincinnati territory is reported as responsible for the satisfactory volume of sales during recent weeks. Increased employment and the general business condition in Milwaukee augurs well for favorable business in November, according to the Milwaukee report. Minneapolis dealers feel very optimistic about the immediate future because of good weather and good crops. Poor agricultural conditions in the farm regions around Denver, are said to have had an adverse effect on light truck sales, although heavy truck sales have been agreeably fair. September and October are reported to have been the best months in years for heavy trucks in this section. San Francisco reports that sales of passenger cars and trucks in northern California for October show approximately a 20 per cent increase over October, 1927, but a slight decrease from the figures of September, 1928. The Los Angeles truck market continues slow.

Arthur E. Parsons, 61, general manager and treasurer of the Brown-Lipe Gear Co., died suddenly while on a business trip to Detroit. Mr. Parsons was well known as a patent attorney. He was also director of the H. H. Franklin Mfg. Co.

NEW JERSEY'S mileage tax applied to buses and trucks moving in interstate commerce was held unconstitutional by Vice-Chancellor Buchanan in an opinion recently rendered by the Chancery Court, Trenton, N. J. The law, passed in 1927, imposed a tax of 1½ cents a mile upon buses and trucks using New Jersey highways in interstate business as common carriers. In accordance with this finding, the vice-chancellor, at the request of 28 motor vehicle operators, issued an injunction preventing the motor vehicle commissioner from suspending their licenses for non-payment of the tax.

D. Andrews, of Continental Motors Corp., was reelected chairman of the manufacturers' advisory board of the National Automobile Parts Association at the recent Detroit Convention. H. G. Root was elected president; W. W. Martin, vice-president, and C. H. Davis, executive secretary.

A DECISION encroaching further on the rights of a lien holder on a motor truck, has been handed down by the Massachusetts District Circuit Court against the Brockway Motor Truck Corp. The company held a lien on a truck being used to haul lacquer thinner to a still. It was seized adjacent to a building where the lacquer was being distilled. The court held that while transportation of lacquer was no violation of the prohibition law the driver must have known

that the lacquer was to be distilled and was not ignorant of the nature of the business carried on or the purpose for which his load of lacquer thinner would be used.

Notwithstanding the fact that no arrest was made and no criminal prosecution was instituted against the driver of the truck, the court held that the government had a right to libel and seize the truck.

Alfred B. Kreitzburg, advertising manager, The Electric Storage Battery Co., died recently at his home in Springfield, Delaware County, Pa. Mr. Kreitzburg was 43 years old and is survived by his wife.

CHAS. COTTA, president of the Cotta Gear Co., announced that capitalization of his company has been increased from \$30,000 to \$200,000 to provide increased facilities for the manufacture of a new five-speed transmission. The new transmission will be designed for trucks and buses from between 5 to 7 tons. It is a selective transmission, making it possible to go from first to fifth speed without going through the intermediary shifts and permitting rapid get-away and quick pick-up. In low, the gear ratio is 8.3 to 1, while in fifth it is direct drive.

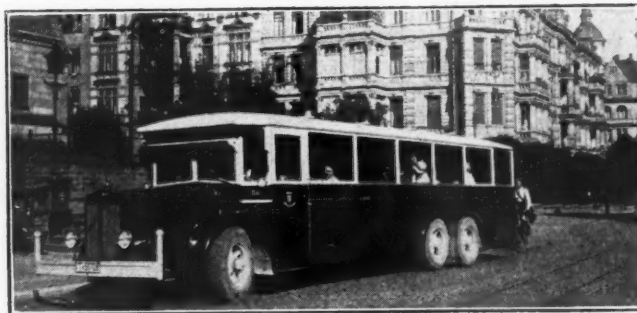
W. F. Chamberlain has been appointed manager of the G.M.C. Truck distributorship at Des Moines, Iowa. Mr. Chamberlain was formerly district representative and is succeeded in that capacity by J. F. Moncrief.

A CODE of traffic signs, signals and markings is being prepared by the American Engineering Standards committee of the Department of Commerce. The scope of this project is the standardization of signs, signals and markings used to direct street traffic, including mechanical equipment, nomenclature, color, shape and location, definition of signal location, type of signals and signal systems.

H. R. Thies has been appointed general sales manager of the Hutto Engineering Co., Detroit, and will have charge of service, production and export sales.

A RENEWED effort will be made to have the next Congress pass legislation designed to regulate the interstate operation of buses. This much was indicated at the annual meeting of the Motor Transport Division of the American Railway Association held in Detroit, Oct. 24-26, to which representatives of the automotive industry were invited to discuss problems in common interest. Representatives of the railroads

stressed their desires for some sort of regulation to adequately control interstate motor carriers and at the same time they made a plea that the automotive industry join with them in working out the legislative problem. Just how far the automotive industry will go toward meeting the requests of the railroad representatives was not clearly indicated, due to the fact that motor vehicle manufacturers were inadequately represented.



Wiesbaden, Germany, is rapidly replacing its trolley system with bus service as a means of transportation. The illustration shows a large Busing six-wheel bus in service

FLEET OPERATORS BUY

the

Myers MAGAZINE OILING System

Why not Get
THIS PROFIT
and also
BOOST SALES

?

Reo Does



Detroit, Michigan
Oct. 5, 1928

Chassis Lubricating Co.
Rahway, New Jersey.

Dear Sirs:

After a lengthy test on several vehicles, we have become convinced of the superiority of a magazine type oiling system for truck chassis lubrication.

To date we have so equipped 20 trucks in our fleet and during the coming overhaul season intend to equip the entire fleet.

I am also recommending that the Myers Magazine Oiling System be embodied in our truck purchase specification.

Yours,
G. C. Heath,
Garage Supt.

Below is a paragraph from the chassis purchase specifications of Mr. H. M. Shulman, Director of Purchases and Mechanics, Hammond, Standish & Co., Detroit Packers.

"Lubrication for the various chassis bearings wherever possible is to be furnished by the Myers Magazine Oiling System, providing for wick feed of oil to the various bearings. The oilers for the spring shackles and other bracketed bearings to be incorporated in the brackets themselves. All oilers, whether integral or attachable, to be equipped with ball valve caps for pressure filling."

Here is a system that requires less than half the attention of greasing—and more than doubles the life of bearings. Less depreciation—less time out for repairs. The System is as regular and reliable as old grandfather's clock—and requires just as little attention.



LOCK-LIKE REGULARITY

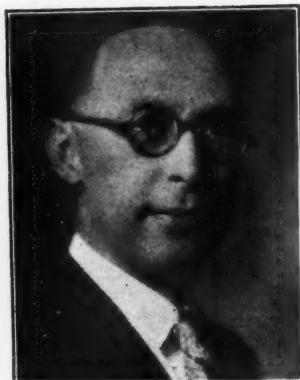
Each drop of oil is FILTERED, too. No dirt is forced into the bearing to slowly destroy it and to clog passages.

It gives efficient and dependable results. That is why the fleet owners are asking for the Myers Magazine Oiling System on their new trucks.

CHASSIS LUBRICATING COMPANY, Inc.
Rahway, N. J. **Detroit, Mich.**

(Home Office)

(Kresge Bldg.)



Lee Anderson, newly appointed advertising counsel for Dodge Brothers Corporation and Graham Brothers Truck Company, division of the Chrysler Corp. Well-known in automotive and advertising circles as sales manager, merchandiser and advertising counsel, Mr. Anderson has organized a new company to be known as Advertisers, Inc., which will take over the above companies in the new year.

ABOUT 50 men from various sections of the country discussed sales and service problems at the annual convention of the salesmen of North East Service, Inc., which was held at the company's home office at Rochester, N. Y., Oct. 29 to Nov. 2. The program arranged and directed by W. K. Lee, sales manager, was opened by welcoming addresses by E. A. Halbleib, general manager of the company, and R. J. Kelleher, general manager of North East Service. In addition to talks on stock, accounting, service engineering and sales, opportunity was given to each man to discuss individual problems.

A. G. Partridge has been appointed managing director of the Goodyear Company of Wolverhampton, England, to fill the vacancy caused by the death of C. P. Skinner. A. Jae Sears succeeds Mr. Partridge as western sales manager and F. W. McConky, manager of the Charlotte branch, succeeds Mr. Sears at Chicago. C. H. Williams, manager of the dealer development department, has been transferred to Los Angeles as assistant to J. K. Hough, manager of coast division sales. P. E. Hanover, assistant branch manager at Boston, succeeds Mr. Williams.

PRODUCTION on the Fordson is expected to start in Cork, Ireland, about Jan. 1. The Ford company is at the present time engaged in moving its tractor plant from Detroit to Cork. The plant will operate on two 8-hour shifts and will have a daily output of 300 tractors. Ford discontinued the production of Fordsons several months ago in order to provide more manufacturing space for the new Model A cars. It is understood that Fordson tractors will be shipped from the Cork factory to America aboard returning Ford ships which are routed to Europe carrying parts for the foreign assembly plants.

C. A. Grainger has been appointed general sales manager of the Allbestos Corp., according to an announcement issued by Wm. G. Kitchen, president. Mr. Grainger, well-known in the wholesale field, was for a number of years general sales manager of the American Hammered Piston Ring Co.

ASUBSTANTIAL interest in the Eclipse Machine Co., Elmira, N. Y., has been purchased by the Electric Auto-Lite Co., according to C. O. Miniger, president. No change in the Auto-Lite capital structure was necessary to effect the purchase, he said.

Needing larger quarters, the National Standard Parts Association recently moved into its new headquarters, Suite 1210, Eaton Tower, Detroit.

ROSS GEAR & TOOL Co. earnings for the first nine months of this year amounted to \$637,630 after Federal taxes. This compares with earnings for the first nine months of 1927 of \$334,730.

CONSTITUTIONALITY of the Iowa ton-mile tax was recently upheld when the Iowa Supreme Court ruled that operators of trucks between fixed terminals must pay the tax. Appeal was taken by members of the Iowa Motor Vehicle Association from the decision of a district court, but the Supreme Court opinion was concurred in by the entire court. The bus operators attacked the law on the ground that it was discriminatory in that farmers and merchants were permitted use of the highways to haul and deliver produce, but exempt from the tax. The Supreme Court also sustained the commission's right to enforce its rules and regulations against operators. This decision reverses the findings of a county judge who refused to issue an injunction against a bus operator who persisted in operating after the commission had rejected his petition for a permit.

O. W. Hayes, president Republic Motor Truck Co., credits the Pacific Coast with starting the movement toward lighter and faster trucks, and with the movement from solid to pneumatic tires. He believes future sale of heavy trucks will be limited, and that tractors will soon be performing the tasks now taken by heavy trucks.

A DEVICE, known as the Roughometer and designed to measure roughness of road surfaces, has been perfected by the Bureau of Public Roads, and is being adopted by many states, according to the Department of Agriculture. The instrument is based on the principle that the amount of spring deflection of an automobile bears a direct relation to the degree of roughness of the road. The recorder gives the total amount of spring compression in inches for any given distance, and a comparison of records obtained on different roads permits a relative estimate of their roughness.

E. L. Lalumier was elected treasurer of the Studebaker Corp. at a recent meeting of the board. He succeeds J. L. Overlock, who becomes assistant to the president. H. E. Dalton was elected secretary and K. B. Elliott, assistant treasurer.

WHOLESALEERS and manufacturers from all parts of the country brought optimistic reports of sales and prophesied a continuation of prosperity in the parts business well into the year of 1929 at the recent convention of the National Standard Parts Association at Cleveland. An increase of 40 per cent through wholesalers and a 30 per cent increase for the business of manufacturer members was reported.

O. L. Arnold, vice-president General Motors Truck Corp., announces the following changes in personnel: R. L. Doyle, sales manager at the factory, and C. F. Uhlmann, as assistant manager of sales. S. P. Landers has been given charge of the New York branch, succeeding B. M. Seymour. O. M. Brede has been made manager of the factory service department, including cab, coach and truck parts. C. W. Whittlesey was appointed to fill the place left vacant by Mr. Brede's promotion as supervisor of branch service.



Custom built long distance van mounted on a Gramm chassis

THE 1929 convention and road show of the American Road Builders' Association will convene on Jan. 14 at Cleveland. The road show will formally open Jan. 14 and the convention on the 15th.

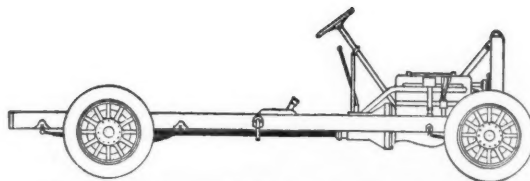
F. F. Rogers has been appointed official Auto-car dealer in Northampton, Lehigh and part of Bucks counties, with headquarters at 10th and Main Sts., Bethlehem, Pa.



More Efficient - More Rugged
Quieter Running - Longer Lived

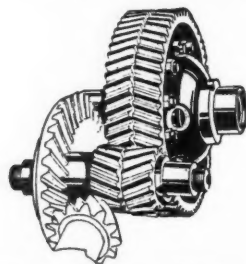
EATON

HERRINGBONE DOUBLE REDUCTION **AXLES**



Ground and Body Clearance

The type of design embodied in this Eaton axle allows low chassis construction without interfering with road freedom.



Strength and Efficiency

No side-thrust on differential bearings. Coarse toothed, wide-faced gears. Integral Herringbone pinion and shaft. Large diameter shafts with minimum of deflection. Driving strains of both bevel and Herringbone gears taken through serrations instead of bolts or rivets. Forged differential cases protected from side gears by hardened and ground thrust-washers—from spider pinions by forged bronze washers.



NOTE HOW
HERRINGBONE
TEETH CARRY
LUBRICANT UP

Positive Lubrication

The Herringbone Gear is a more effective lubricant conveyor. The gear teeth form "buckets" which carry the oil from the reservoir in the bottom of the axle and keep the entire gear assembly generously lubricated at all times.

*Eaton engineers will be pleased to
consult with you on your axle problems*

THE EATON AXLE & SPRING COMPANY *Cleveland, Ohio*

MADE BY THE MAKERS OF EATON SPRINGS AND EATON BUMPERS

EATON

HERRINGBONE DOUBLE REDUCTION AXLES

George S. Piroomoff has been appointed technical assistant to the president of Brockway Motor Truck Corp., and Norman S. Roblee has been appointed vice-president and sales manager of Indiana Truck Corp. Mr. Piroomoff will be located at New York headquarters, and Mr. Roblee at the Marion, Ind., offices.

MOTOR TRUCKS are to be tried out as a substitute for "dinky" trains in one of the large strip mines in Kansas. If the test proves successful, it is expected that many hundreds of trucks will be used for that purpose in the state. C. E. Lange, manager of the Mack-International Truck Co. branch in Kansas City, has sold six 1½-ton trucks to the Pittsburg-Midway Coal Co., Pittsburg, Kan., to be used in a test. The trucks are equipped with a special dump bed built by the National Steel Co., Kansas City.

C. E. Eldridge, sales manager Reo Motor Car Co., recently announced the appointment of three assistant sales managers, as follows: Carl Parker, in charge of Speedwagon sales; E. G. Poxson, in charge of territorial analysis, and R. G. Hudson in charge of Canadian and export sales.

THE Brown-Lipe Gear Co. has announced a complete line of replacement clutch plates, of both lined and unlined types, covering the majority of all makes of cars and trucks. Sales of this line of clutch plates to the parts wholesalers, domestic and export, will be handled exclusively by the Burgess-Norton-Dall Corp., a subsidiary of the Burgess-Norton Mfg. Co., and Dall Motor Parts Co. Plates will be warehoused at Brooklyn, Detroit and Chicago.

Three shop buildings of the former Moline Wagon Co., Stoughton, Wis., have been leased by the Highway Trailer Co., Edgerton, Wis., to provide more adequate facilities for the construction of trailer bodies, steel dump bodies and motor truck bodies and cabs.

PRIZES aggregating \$500 have been offered for methods of replacing axle shafts in trucks and passenger cars by W. D. Foreman, 5353 S. State St., Chicago. Two prizes of \$50 each are offered for general methods for this operation in passenger cars and in trucks. Forty-nine awards will be made for methods of replacing shafts in specific models of vehicles. The contest closes Dec. 15.

W. H. May, vice-president, Shuler Axle Co., died on October 30. Mr. May was 80 years of age and had been an executive of the company for the past eight years. He was formerly president of the National Gasket Co.

THE Delco-Remy Corp. has acquired rights to manufacture the Electrolock, for locking automobiles. Delco-Remy with this addition, now has three auto locks on its list of products: a Coil Lock, which breaks the ignition circuit inside the coil; a Dual Lock, which locks both transmission and ignition; and the Electrolock, which breaks the ignition circuit and grounds the distributor.

H. A. Flannery, division superintendent of the Goodyear Tire & Rubber Company's plant at Akron, has been appointed general superintendent of the Goodyear plant at Wolverhampton, Eng. Mr. Flannery will fill the vacancy caused by the death of Thomas A. Linnane.

THE automotive parts and accessory industry which set a new record for all time in August, and closely approached that record in September, has maintained operations in October close to the September level and well ahead of last year, according to the Motor & Accessory Manufacturers Association. The announcement further says that manufacturers of engine, bodies and parts for original equipment of cars and trucks, as well as for the replacement trade, will enjoy a record fourth quarter similar to car and truck manufacturers.

W. H. Brearley, head of the legal department of the Autocar Co., has been elected president of the Pennsylvania Automotive Association. Other officers are: R. W. Shreiner, secretary and treasurer; Claude S. Klugh, manager, and G. A. Hoeveler, G. G. McFarland, J. G. Roberts and J. B. Arbuckle, vice-presidents.

RELAY MOTORS CORP., Lima, Ohio, recently held a three-day dealers' meeting at its factory, in which 150 dealers participated. Sales and production was discussed and interesting data gathered from the field on the operation of Relays were presented. Visitors were shown how the Relay axle is constructed and assembled and enlightened as to the principle involved. Demonstrations were held to show what the truck could do under various operating circumstances.

Arthur G. Eaton, recently elected a vice-president and sales director of the Aluminum Industries, Inc., Cincinnati, will be in charge of the company's new general sales office in the Fisher Building, Detroit. Associated with him will be B. J. Plumley. Mr. Eaton was formerly director of purchases of Dodge Brothers, Inc.

THE Truck Committee of the American Engineering Council has adopted a standard roadside stop sign which is octagonal in shape and consists of red letters on a yellow background. This combination was adopted on account of the advantage of night visibility.

E. E. Walker was elected president of the Erie Malleable Iron Co., Erie, Pa., and G. R. Metcalf, Sr., former president, chairman of the board. Mr. Walker was formerly vice-president and general manager of the company.

Coming Events

SHOWS

- *Albany, N. Y.—State Armory...Mar. 19-26
- *Buffalo, N. Y.—174th Regiment Armory.....Jan. 12-19
- *Chattanooga, Tenn.—Hippodrome.....Jan.
- *Chicago—National Coliseum Jan. 26-Feb. 2
- *Cleveland—Cleveland Auditorium, American Road Builders' Assn., Jan. 14-19
- *Detroit, Mich.—Convention Hall Jan. 19-26
- *Harrisburg, Pa.—Shaffer Bldg....Feb. 2-9
- *Mankato, Minn.—Mankato Armory, Feb. 13-16
- New York—National, Grand Central Palace.....Jan. 5-12
- *Providence, R. I.—Cranston St. Armory.....Feb. 16-23
- *Quebec, Can.—Drill Hall.....Mar. 16-23

CONVENTIONS

- Cleveland, O.—American Road Builders' Assn.Jan. 14-19
- Cleveland, O.—Cleveland Hotel.....Jan. 16
- Meeting—North Central Div. of Natl. Highway Traffic Assn.
- New Orleans, La.....Dec. 3
- Meeting—South Central Div. of Natl. Highway Traffic Association.
- New York City, 12 E. 53rd St....Dec. 10-12
- Annual Meeting—Natl. Highway Traffic Assn.

* Include Truck Exhibit.

ALBERTSON & CO., manufacturers of Sioux tools, has begun construction upon its new \$60,000 addition, west of the present plant, which will be 40 x 155 ft., with four floors and basement. It will be reinforced concrete construction and is scheduled to be fully equipped and in operation by Feb. 15.

The Roller-Smith Co. announces the appointment of Arthur H. Abbott, Inc., Boston, and Wise & Braisted, Detroit, as district sales agents in the New England and Michigan territories.

SEPTEMBER production of trucks in the United States as reported to the Department of Commerce by factories, was 54,850 as compared to 60,763 in August and 33,944 in September, 1927.

General Motors Corp. has bought the Guide Motor Lamp Co. of Cleveland for \$913,690. The company does a \$3,000,000 annual business. Plans are to operate the company under the present personnel.

Standard Training of Mechanics Urged at S.A.E. Meeting

(Continued from page 11)

scribed in detail by R. A. C. Henry, of the Canadian National Railways. In discussing the topic, Mr. Daniels, of the United States Trucking Corp., said that congestion in the metropolitan district works against store-door delivery. This condition would be obviated, he said, if buildings contained a ground-floor section devoted to truck delivery.

Two moot questions dominated a session given over to service problems. They were: "Is it cheaper to farm out work or maintain one's own shop?" and "When is the proper time to trade in the old truck?" Papers on both these questions were presented by E. C. Wood, superintendent of transportation of the Pacific Gas & Electric Co., San Francisco.

Consideration of the first of the two subjects developed the fact that there is no simple answer to the question because of many variables, such as size of fleet, territorial location, type of operation, etc. But while Mr. Wood came to no conclusion in regard to the desirability of farming as against maintaining one's own shop, he did make it plain that because of the need for greater economy of fleet operation, each operator must make a study of the matter for himself and decide upon the more economical course. In making a survey of fleet operations on the Pacific Slope, Mr. Wood ascertained that there are some firms that maintain their fleets by annual overhauls and find it cheaper to have this work, including body repairs and painting, done outside, when they can assure the outside shop of a certain volume of work.

Mr. Wood made an analysis of information on tire, electrical and upholstery repairs and, comparing the fleet operator's shop-time, plus his overhead, with invoices received for this work from outside shops, it was found just as cheap, and in some instances cheaper, to farm out such work.

Taking up his other moot subject, Mr. Wood said, "I think we all agree that the proper time to determine whether it is cheaper to maintain a vehicle in service or to replace it is when it requires some major repair, one that will be costly if the vehicle is to be retained in service. The fitness of the vehicle for continuous service must then be determined, and a survey made of the job it is proposed to do. This includes the kind of work, the amount of money to be spent, the cost of a new vehicle, the salvage value of the vehicle in question, and whether it would be cheaper to retain it in its present service or put it on lighter work. However, each case must be judged on its merits after full consideration, and it seems that this is the only possible way to arrive at a solution of the problem."

Mr. Wood's paper on "Highway Safety Education and Accident Pre-

vention" elicited equally as much discussion as did the two other subjects. In answer to the query "What's the safe number of hours for a driver to be at the wheel?" Mr. Wood cited the experience of one operator whose accident curve dropped off when drivers were held to 40 miles a day. Capt. C. H. Henningshaw said that the Army Transport School holds 60 to 80 miles a day a safe figure.

Operating conditions and demands made upon the driver determine the fatigue factor, but it was declared that a driver who must remain at the wheel for more than 9 hours is a menace to the public.

Complete Shop Service Builds \$500,000 Volume

(Continued from page 13)

aspects of the undertaking. The drawings and theory of engineering will mean more to him when he has finished the job. He is looking forward with keen anticipation to taking complete charge of designing and drawing a subsequent order when he gets back to his desk. We will not hesitate to allow him the responsibility, either, for that is another form of 'mental wage' that is appreciated as much as the pay envelope—and to a degree helps us limit our payroll in proportion to our net profit. 'Mental wages' pick up when workers are given some responsibilities and a chance to show initiative."

This credo is extended to department heads as well. Each head runs his department according to his best judgment, and is responsible to the management only in results. Staley has gone a step farther. To insure a permanent future, and to give his men something definite to look forward to, he recently incorporated his company, making some of his department heads officials of the company, and others potential owners and part managers. Giving employees a chance to help take the steering wheel supplements the pay envelope with man's most satisfying wage.

But Staley's men must know their "onions." He applies this rule invariably, even to his own son, Allen, 19, who is now in the business. He started as a floor sweeper, and Staley's instruction to his department heads was, "Give him the dirtiest jobs you've got, and see that he does them well, but treat him as fair as you would any other employee."

The lad has now advanced to mechanic's helper and is doing exceedingly well.

"If my son ever takes the reins of this business," Mr. Staley commented, "he'll at least know what it's all about."

The third point of Staley's program of management that has brought him outstanding success revolves about advertising, and is based on the two points previously discussed—complete service under one management, and personnel.

"Direct-mail—personal letters—is the best bet in getting the fleet business," declared Mr. Staley. "Our regular mailing list consists of 9000, mostly customers, including truck owners and owners of passenger cars. This list gets a letter every month—a straight business letter, without catch phrases and alleged humor. Trying to be funny in business is futile, I believe. About four times a year we try to send something useful in our letters. Application blanks for licenses, new motor laws, headlight laws, et cetera."

"Also we keep our customer turnover to the minimum by giving special attention to accounts on our ledgers. If an account is absent from our books for a period of 90 days, he gets a letter, signed personally by myself. The best source of business is our own ledgers."

Spot Shop Defects to Boost Profits

(Continued from page 19)

charge has before him at all times a progress report showing the status of each job in the shop. Any hold-up or delay is revealed and steps are taken to remedy the situation. Small establishments cannot afford such complete records but the same idea can be employed. If the superintendent follows a few jobs with the thought of discovering anything which holds back the work, from the time the vehicle enters the building until the job is ready to deliver to the owner, he will be able to check his department effectively.

Bus Division to Study Bus in Mail Service

THE bus division of the American Automobile Association is planning the appointment of a committee to study the carrying of U. S. mails on buses. This action has been taken in view of the probability of early recommendation of a bill by the Postmaster General which would require the carrying of mails by buses in districts where service may be expedited or improved. The committee would consider rates and conditions surrounding such service and would recommend to the legislative committee of the association the course to be followed.

THE Handy Governor Corp. recently increased its manufacturing facilities by the addition of a large new building adjacent to its present plants on West Fort St., Detroit. The corporation in addition to its governor produces the Handy air cleaner and the Handy oil filter which are built into the production models of several vehicle manufacturers. The governor is now used on General Motors Buick-engine trucks.

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks Will be Found at the End of Gasoline Commercial Cars

Those Chassis Which Are Sold and Recommended for Bus Use Are Designated in the Following Table by Reference Sign (\$) in Front of the Name

For Motor Bus Chassis See Pages 48 and 49

* Changes

† New Models

Key of abbreviations, page 50

(Where prices are not given it is because we have been unable to get them from authoritative sources)

Trade Name and Model	General			Engine					Electrical System	Clutch	Gearset		Rear Axle		Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase												
	Chassis Price	Tire Size		Make and Model	Number of Cylinders	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System			Governor (Make)	Radiator (Make)	Fuel System		Ignition System	Generator and Starter (Make)			Type and Make	Make and Model	Location	No. of Forward Speeds	Universals (Make)	Make and Model	Type	Total Reduction in High	Total Reduction in Low	Brakes, Location	Cab to rear of frame	Cab to rear axle	Chassis Weight (lbs.)
		Front (inches)	Rear (inches)										Carburetor (Make)	Fuel Feed																	
1000 Pounds																															
Durant Nat. Com.	305	107	107	B 30x4 50	Own	4-31x4 1/2	21 7/8	H	PC	Non	Har	Car	D-R	D-R	P. Own	Own Nat.	U	3	Own	Own	4.18	13.88	E*	Own Nat.	Own	75 1/2	75 1/2	1695			
Durant Com. Ch.	495	107	107	B 28x4 75	Con	4-31x4 1/2	18 2/3	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.57	16.16	E*	Own	Own	75 1/2	75 1/2	1825			
Fargo Packet.	545	110	110	B 28x4 75	Own	4-31x4 1/2	21 7/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.36	14.48	E*	Own	Own	75 1/2	75 1/2	1825			
General Motors T-11.	585	110	110	B 28x4 75	Own	4-31x4 1/2	21 7/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.36	14.48	E*	Own	Own	75 1/2	75 1/2	1825			
Graham Brothers SE.	665	110	110	B 28x5 00	Own	4-31x4 1/2	21 7/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.36	14.48	E*	Own	Own	75 1/2	75 1/2	1825			
Graham Brothers SEW.	675	110	110	B 31x5 25	Own	4-31x4 1/2	21 7/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.36	14.48	E*	Own	Own	75 1/2	75 1/2	1825			
Reo Special Wagon Jr.	895	115	115	B 28x5 25	Con 16E	4-31x4 1/2	21 7/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.36	14.48	E*	Own	Own	75 1/2	75 1/2	1825			
Stud. Erskine 52B.	675	109	109	P 30x5	Con 9F	4-31x4 1/2	18 2/3	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.12	15.7	G†	Own	Own	75 1/2	75 1/2	1894			
1500 Pounds																															
Fargo Clipper.	725	120	120	B 29x5 50	Own	4-31x4 1/2	23 1/4	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.73	16.16	G†	Own	Own	75 1/2	75 1/2	2110			
Graham Brothers DEF.	775	120	120	B 31x5 25	Own	4-31x4 1/2	23 1/4	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.73	16.16	G†	Own	Own	75 1/2	75 1/2	2110			
Graham Brothers DEF.	800	120	120	B 30x5	Con 30x5	4-31x4 1/2	23 1/4	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.73	16.16	G†	Own	Own	75 1/2	75 1/2	2110			
Graham Brothers DEF.	790	120	120	B 30x5	Con 30x5	4-31x4 1/2	23 1/4	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.73	16.16	G†	Own	Own	75 1/2	75 1/2	2110			
Int. Harvester Spec. Del.	725	124	124	B 30x5 25	Own	4-31x4 1/2	23 1/4	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.73	16.16	G†	Own	Own	75 1/2	75 1/2	2110			
Rugby Fast Mail.	725	110	110	B 30x5 50	Con	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.45	14.8	A†	Own	Own	77 1/2	43	1760			
Stewart Buddy.	1165	112	112	B 30x5 25	Own	4-31x4 1/2	24 1/4	H	FP	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	4.9	30.0	F	Own	Own	54	34	2352			
1 Ton																															
Acme 14.	1200	120	120	P 30x5	Con 18C	4-31x4 1/2	18 2/3	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	6.1	18.73	B†	Sal SK267	Own	90	55	2000			
Acme 16.	1200	120	120	P 30x5	Con 18C	4-31x4 1/2	18 2/3	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	6.1	18.73	B†	Sal SK267	Own	90	55	2000			
Acme 20P.	1185	132	132	B 32x6 00	Con 18C	4-31x4 1/2	18 2/3	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	92	55	3200			
Biederman.	1200	132	132	P 30x5	Con 18C	4-31x4 1/2	18 2/3	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	92	55	3200			
Chevrolet Cap.	495	124	124	P 30x5	Own Cap	4-31x4 1/2	21 7/8	H	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.71	19.07	A†	Shu	Own	84 1/2	48	2170			
Chicago AX.	121 1/2	121 1/2	121 1/2	P 32x6	Wau XA	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	6.43	30.86	A†	Shu	Own	47 1/2	48	2850			
Clydesdale 16.	140	130	130	P 34x5	Con 8A	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.60	20.5	A†	Shu	Own	310	47 1/2	3450			
Commerce 8A.	130	130	130	P 30x5	Con 11U	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.1	20.4	E†	Shu	Own	310	47 1/2	2900			
Commerce 20Z.	136	136	136	P 30x5	Con 16C	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.1	20.4	E†	Shu	Own	310	47 1/2	3400			
Day-Elder M.	1345	131	131	P 34x5	Con 16C	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.8	23.2	A†	Shu	Own	103 1/2	56	3475			
Denby 41.	128	128	128	P 34x5	Her OX	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.8	23.2	A†	Shu	Own	103 1/2	56	3475			
Diamond T76.	130	130	130	P 30x5	Con 18E	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.12	18.6	G†	Col 3506	Own	90	3240				
Diamond T150.	127 1/2	127 1/2	127 1/2	P 30x5	Con 18E	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.12	18.6	G†	Col 3440	Own	90	3240				
Eagle 10.	123	123	123	P 30x5	Con 34L	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.12	18.6	G†	Col 1631	Own	91	3000				
Eagle 16.	123	123	123	P 30x5	Con 34L	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.12	18.6	G†	Col 1631	Own	91	3000				
Federal Scout.	123	123	123	P 30x5	Wau X	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.85	22.3	G†	Col 310	Own	91	2500				
Fisher Jr. Express.	140	140	140	P 30x5	Con 31L	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	6.1	20.4	E†	Shu	Own	108	51	2400			
Garford 20Z.	136	136	136	P 30x5	Pontiac	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
General Motors T-19.	745	126 1/2	126 1/2	P 30x5	Buick Sd.	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
General Motors T-20.	1095	132	132	P 30x5	Buick Sd.	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
Gramm 263N.	1485	133	133	P 30x5	Her CT	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
Gramm-Bernstein 10.	129	129	129	P 30x5	Her CT	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
Hahn S4.	138	138	138	P 30x5	Her CT	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
Hahn S6.	137	137	137	P 30x5	Her CT	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
Indiana 200.	124	124	124	P 30x5	Wau XA	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.43	27.37	E†	Shu	Own	108	73 1/2	3400			
Int. Harv. 6 Sp. Spec.	1460	140	140	P 34x5	Own	4-31x4 1/2	24 1/4	L	SP	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.16	19.88	A†	Shu	Own	100	84	3780			
Kaiser.	1460	140	140	P 30x5	Con 12C	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.10	17.1	A†	Shu	Own	100	64	3000			
Larnabee A3.	133	133	133	P 30x5	Wau V	4-31x4 1/2	19 9/16	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.22	18.47	E†	Shu	Own	100	49 1/2	3100			
Leedingham.	985	123	123	P 30x5	Con 16E	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.22	18.47	E†	Shu	Own	120	72	2850			
Reo DC.	1075	128	128	P 30x5	Con 16E	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.22	18.47	E†	Shu	Own	85 1/2	44 1/2	2755			
Tracy Exp.	975	128	128	P 30x5	Con 16E	4-31x4 1/2	25 3/8	L	PC	Non	Har	Car	D-R	D-R	P. Own	Own	U	3	Own	Own	5.22	18.47	E†	Shu	Own	85 1/2	44 1/2	2755			

Key of abbreviations, page 50

Trade Name and Model	General			Engine						Electrical System		Clutch	Gearset		Rear Axle		Gear Ratios		Steering Gear (Make)	Standard Wheelbase		Chassis Weight (lbs.)										
	Chassis Price	Standard Wheelbase (inches)	Maximum Wheelbase (inches)	Tire Size	Rear (inches)	Front (inches)	Make and Model	Number of Cylinders	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System		Governor (Make)	Radiator (Make)	Fuel System		Ignition System (Make)	Generator and Starter (Make)		Type and Make	Make and Model		Location	No. of Forward Speeds	Universals (Make)	Rear Axle		Type	Total Reduction in High	Total Reduction in Low	Brakes, Location	Front Axle Make and Model
															Carburetor (Make)	Fuel Feed																
1 Ton—Cont'd																																
Service 20Z	136	128	128	P 30x5	P 30x5	Bud HS6	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Stewart Buddy	965	128	128	P 30x5	P 30x5	Con 8R	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Studebaker GD-N	1075	140	130	P 30x5	P 32x6	Win C	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
United 16C	122 1/2	122 1/2	122 1/2	P 32x4 1/2	P 32x4 1/2	Wau X	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
U. S. U.	1850	138	162	P 34x5	P 34x5	Con 20L	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Wachusett S	152	152	152	P 34x5	P 34x5	Bud WTU	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
White 15B	154 1/2	133 1/2	130	P 30x5	P 30x5	Con 8R	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Willis Knight T-100	130	130	130	P 30x5	P 30x5	Own GKA	6-2 1/2x4 3/8	20 7/8	X	FF	Non	Own	Own	Til	A-L	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
1 1/4 Ton																																
Atterbury 20B	132	132	132	P 30x5	P 30x5	Lye 8	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Biederman	154	130	130	P 32x6	P 32x6	Con 8R	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Brookway Junior	130	130	130	P 30x5	P 32x6	Win C	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Brookway JF	137	137	137	P 30x5	P 32x6	Win C	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Clinton 20B	153	153	153	P 30x5	P 34x5	Bud WTU	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Clydesdale 10A	154	154	154	P 34x5	P 34x5	Con S4	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Commerce 25Z	135	135	135	P 30x5	P 32x6	Bud HS6	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Corbett 620	135	135	135	P 30x5	P 32x6	Con 18E	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
DeLuxe	135	135	135	P 30x5	P 32x6	Con 18E	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Diagonal T77	133	133	133	P 30x5	P 30x5	Her WXA	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Garford 25Z	131	131	131	P 30x5	P 32x6	Bud HS6	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Godfredson B24	136	136	136	P 30x5	P 30x5	Bud WTU	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers BE	995	130	130	P 30x5	P 30x5	Dodge	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers BEW	1030	130	130	P 30x5	P 32x6	Dodge	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers BEF	1110	140	140	P 30x5	P 32x6	Dodge	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers BEF	1040	130	130	P 30x5	P 32x6	Dodge	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers BEW	1035	140	140	P 30x5	P 30x5	Dodge	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers IEW	1100	140	140	P 30x5	P 32x6	Dodge	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Graham Brothers N	1455	133	133	P 30x5	P 30x5	Lye 8	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Gramm-Bernstein 10	129	129	129	P 30x5	P 30x5	Lye 8	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Indiana 11X	120	120	120	P 30x5	P 30x5	Her OX	6-32x4 1/2	25 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Int. Harvester S-24	129 1/2	130	130	P 32x4 1/2	P 32x4 1/2	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Int. Harvester S-36	130	130	130	P 32x6	P 32x6	Bud HS6	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Macfar 31	132	132	132	P 35x5	P 35x5	Bud HS6	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Master 11	128 1/2	128 1/2	128 1/2	P 30x5	P 30x5	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Republic 75-6	124	124	124	P 30x5	P 30x5	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Republic 75	120	120	120	P 30x5	P 30x5	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Salford S	120	120	120	P 30x5	P 30x5	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Salford Pacemaker 25	136	136	136	P 32x6	P 32x6	Con S4	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Service 25Z	137	137	137	P 32x6	P 32x6	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Sterling DB7	1295	130	145	P 32x6	P 32x6	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Stewart 16	1245	130	145	P 32x6	P 32x6	Lye 4SL	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Stewart 16X	1295	130	145	P 30x5	P 30x5	Her OX	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
United 20C6	1295	132	142	P 33x5	P 33x5	Con 16C	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Valley	1275	132	142	P 32x6	P 32x6	Her GRC	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Vite 57	2725	129	129	P 30x5	P 30x5	Con 31L	6-2 1/2x4 3/8	19 1/8	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
Woods 2066	156	156	156	P 30x5	P 30x5	Con S4	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Zen	A-L	D-R	P. B&B	5.1	20.4	U	Col	Han	89 1/2	50 1/2	3400								
1 1/2 Ton																																
Atterbury 20B	136	136	136	P 30x5	P 30x5	Con S4	6-32x4 1/2	27 3/4	L	PC	Non	Lon	Z																			

153	174	188	198	208	218	228	238	248	258	268	278	288	298	308	318	328	338	348	358	368	378	388	398	408	418	428	438	448	458	468	478	488	498	508	518	528	538	548	558	568	578	588	598	608	618	628	638	648	658	668	678	688	698	708	718	728	738	748	758	768	778	788	798	808	818	828	838	848	858	868	878	888	898	908	918	928	938	948	958	968	978	988	998	1008	1018	1028	1038	1048	1058	1068	1078	1088	1098	1108	1118	1128	1138	1148	1158	1168	1178	1188	1198	1208	1218	1228	1238	1248	1258	1268	1278	1288	1298	1308	1318	1328	1338	1348	1358	1368	1378	1388	1398	1408	1418	1428	1438	1448	1458	1468	1478	1488	1498	1508	1518	1528	1538	1548	1558	1568	1578	1588	1598	1608	1618	1628	1638	1648	1658	1668	1678	1688	1698	1708	1718	1728	1738	1748	1758	1768	1778	1788	1798	1808	1818	1828	1838	1848	1858	1868	1878	1888	1898	1908	1918	1928	1938	1948	1958	1968	1978	1988	1998	2008	2018	2028	2038	2048	2058	2068	2078	2088	2098	2108	2118	2128	2138	2148	2158	2168	2178	2188	2198	2208	2218	2228	2238	2248	2258	2268	2278	2288	2298	2308	2318	2328	2338	2348	2358	2368	2378	2388	2398	2408	2418	2428	2438	2448	2458	2468	2478	2488	2498	2508	2518	2528	2538	2548	2558	2568	2578	2588	2598	2608	2618	2628	2638	2648	2658	2668	2678	2688	2698	2708	2718	2728	2738	2748	2758	2768	2778	2788	2798	2808	2818	2828	2838	2848	2858	2868	2878	2888	2898	2908	2918	2928	2938	2948	2958	2968	2978	2988	2998	3008	3018	3028	3038	3048	3058	3068	3078	3088	3098	3108	3118	3128	3138	3148	3158	3168	3178	3188	3198	3208	3218	3228	3238	3248	3258	3268	3278	3288	3298	3308	3318	3328	3338	3348	3358	3368	3378	3388	3398	3408	3418	3428	3438	3448	3458	3468	3478	3488	3498	3508	3518	3528	3538	3548	3558	3568	3578	3588	3598	3608	3618	3628	3638	3648	3658	3668	3678	3688	3698	3708	3718	3728	3738	3748	3758	3768	3778	3788	3798	3808	3818	3828	3838	3848	3858	3868	3878	3888	3898	3908	3918	3928	3938	3948	3958	3968	3978	3988	3998	4008	4018	4028	4038	4048	4058	4068	4078	4088	4098	4108	4118	4128	4138	4148	4158	4168	4178	4188	4198	4208	4218	4228	4238	4248	4258	4268	4278	4288	4298	4308	4318	4328	4338	4348	4358	4368	4378	4388	4398	4408	4418	4428	4438	4448	4458	4468	4478	4488	4498	4508	4518	4528	4538	4548	4558	4568	4578	4588	4598	4608	4618	4628	4638	4648	4658	4668	4678	4688	4698	4708	4718	4728	4738	4748	4758	4768	4778	4788	4798	4808	4818	4828	4838	4848	4858	4868	4878	4888	4898	4908	4918	4928	4938	4948	4958	4968	4978	4988	4998	5008	5018	5028	5038	5048	5058	5068	5078	5088	5098	5108	5118	5128	5138	5148	5158	5168	5178	5188	5198	5208	5218	5228	5238	5248	5258	5268	5278	5288	5298	5308	5318	5328	5338	5348	5358	5368	5378	5388	5398	5408	5418	5428	5438	5448	5458	5468	5478	5488	5498	5508	5518	5528	5538	5548	5558	5568	5578	5588	5598	5608	5618	5628	5638	5648	5658	5668	5678	5688	5698	5708	5718	5728	5738	5748	5758	5768	5778	5788	5798	5808	5818	5828	5838	5848	5858	5868	5878	5888	5898	5908	5918	5928	5938	5948	5958	5968	5978	5988	5998	6008	6018	6028	6038	6048	6058	6068	6078	6088	6098	6108	6118	6128	6138	6148	6158	6168	6178	6188	6198	6208	6218	6228	6238	6248	6258	6268	6278	6288	6298	6308	6318	6328	6338	6348	6358	6368	6378	6388	6398	6408	6418	6428	6438	6448	6458	6468	6478	6488	6498	6508	6518	6528	6538	6548	6558	6568	6578	6588	6598	6608	6618	6628	6638	6648	6658	6668	6678	6688	6698	6708	6718	6728	6738	6748	6758	6768	6778	6788	6798	6808	6818	6828	6838	6848	6858	6868	6878	6888	6898	6908	6918	6928	6938	6948	6958	6968	6978	6988	6998	7008	7018	7028	7038	7048	7058	7068	7078	7088	7098	7108	7118	7128	7138	7148	7158	7168	7178	7188	7198	7208	7218	7228	7238	7248	7258	7268	7278	7288	7298	7308	7318	7328	7338	7348	7358	7368	7378	7388	7398	7408	7418	7428	7438	7448	7458	7468	7478	7488	7498	7508	7518	7528	7538	7548	7558	7568	7578	7588	7598	7608	7618	7628	7638	7648	7658	7668	7678	7688	7698	7708	7718	7728	7738	7748	7758	7768	7778	7788	7798	7808	7818	7828	7838	7848	7858	7868	7878	7888	7898	7908	7918	7928	7938	7948	7958	7968	7978	7988	7998	8008	8018	8028	8038	8048	8058	8068	8078	8088	8098	8108	8118	8128	8138	8148	8158	8168	8178	8188	8198	8208	8218	8228	8238	8248	8258	8268	8278	8288	8298	8308	8318	8328	8338	8348	8358	8368	8378	8388	8398	8408	8418	8428	8438	8448	8458	8468	8478	8488	8498	8508	8518	8528	8538	8548	8558	8568	8578	8588	8598	8608	8618	8628	8638	8648	8658	8668	8678	8688	8698	8708	8718	8728	8738	8748	8758	8768	8778	8788	8798	8808	8818	8828	8838	8848	8858	8868	8878	8888	8898	8908	8918	8928	8938	8948	8958	8968	8978	8988	8998	9008	9018	9028	9038	9048	9058	9068	9078	9088	9098	9108	9118	9128	9138	9148	9158	9168	9178	9188	9198	9208	9218	9228	9238	9248	9258	9268	9278	9288	9298	9308	9318	9328	9338	9348	9358	9368	9378	9388	9398	9408	9418	9428	9438	9448	9458	9468	9478	9488	9498	9508	9518	9528	9538	9548	9558	9568	9578	9588	9598	9608	9618	9628	9638	9648	9658	9668	9678	9688	9698	9708	9718	9728	9738	9748	9758	9768	9778	9788	9798	9808	9818	9828	9838	9848	9858	9868	9878	9888	9898	9908	9918	9928	9938	9948	9958	9968	9978	9988	9998	10008	10018	10028	10038	10048	10058	10068	10078	10088	10098	10108	10118	10128	10138	10148	10158	10168	10178	10188	10198	10208	10218	10228	10238	10248	10258	10268	10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Key of abbreviations, page 50

Trade Name and Model	General			Engine						Electrical System		Clutch	Gearset	Rear Axle		Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase										
	Chassis Price	Maximum Wheelbase (inches)	Tire Size	Make and Model	Number of Cylinders	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)	Fuel System			Ignition System (Make)	Generator and Starter (Make)	Type and Make	Make and Model			Final Drive	Type	Total Reduction in High	Total Reduction in Low	Brakes, Location						
											Carburetor (Make)														Fuel Feed					
1 1/2 Ton—Cont'd																														
Witt-Will NN.....	2850	144	S 36x7	Con S4	4-41x5 1/2	28.9	L	PC	Non	Own	Zen	V	Eis	D-R	D-B-L	Tim 64600D	U	4	Spi	Tim 64600D	W	1 1/2	7.28	30.3	A*	Tim 15300	Ros	136 1/2	70 1/2	4300
Witt Will N6.....		Opt.	P 32x6	Con 15C	6-31x4 1/2	25.3	L	PC	Non	Own	Zen	V	A-L	A-L	P-B&B	Tim 64600D	U	3	Spi	Tim 64600D	S	F	6.43	25.72	A	Shu 5405	Ros	118	70	3480
World D-8.....		148 1/2	DP30x5	Con 15S	8-31x4 1/2	28.8	L	PC	Non	Mod	Zen	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	106 3/4	69 3/4	3695
1 3/4 Ton																														
Graham Bros ME.....	1345	150	P 32x6	Dodge	6-31x4 1/2	27.3	L	PC	Han	Fed	Ste	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	106 3/4	69 3/4	3740
Graham Bros ME.....	1380	150	P 32x6	Dodge	6-31x4 1/2	27.3	L	PC	Han	Fed	Ste	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	106 3/4	69 3/4	3740
Graham Bros ME.....	1325	150	P 36x6	Dodge	6-31x4 1/2	27.3	L	PC	Han	Fed	Ste	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	126 1/2	84 1/2	3810
Graham Bros LE.....	1415	165	P 32x6	Dodge	6-31x4 1/2	27.3	L	PC	Han	Fed	Ste	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	126 1/2	84 1/2	3855
Graham Bros LE.....	1450	165	P 34x5	Dodge	6-31x4 1/2	27.3	L	PC	Han	Fed	Ste	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	126 1/2	84 1/2	3855
Graham Bros LE.....	1395	165	P 36x6	Dodge	6-31x4 1/2	27.3	L	PC	Han	Fed	Ste	V	N-E	N-E	P-B&B	Own	U	4	U-P	Own	S	1 1/2	5.67	36.83	G†	Own	Ros	126 1/2	84 1/2	3855
2 Ton																														
Ame 44.....	150	162	P 32x6	Con S4	4-41x4 1/2	28.9	L	FP	Non	Per	Str	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A	Tim 14703	Ros	120 1/2	73 1/2	4000
Ame 46.....	150	162	P 32x6	Con 16C	6-31x4 1/2	27.3	L	FP	Non	Per	Str	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A	Tim 14703	Ros	120 1/2	73 1/2	4000
Ame 340.....	156	166	P 32x6	Con S4	4-41x4 1/2	28.9	L	FP	Non	Per	Str	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A	Tim 14703	Ros	120 1/2	73 1/2	4000
Ame 346.....	156	166	P 32x6	Con 16C	6-31x4 1/2	27.3	L	FP	Non	Per	Str	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A	Tim 14703	Ros	120 1/2	73 1/2	4000
Acorn 40.....	2500	144	P 36x5	Con S4	4-41x4 1/2	28.9	L	PC	Non	Chi	Zen	G	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Acorn 40P.....	2600	144	DP34x5	Con 15C	6-31x4 1/2	27.3	L	PC	Non	Chi	Zen	G	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Am. La France Chief.....	2850	156	P 32x6	Her OX	4-4x5 1/2	25.6	L	PC	Bud	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Armleder 40.....	149	187	S 36x4	Bud HS	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Armleder 40-6.....	154	166	S 38x4	Bud HS	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Autocar A.....	142	166	S 34x4	Con S4	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Brookway EY.....	150	166	S 34x4	Con S4	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Brookway SY.....	142	164 1/2	S 34x4	Con S4	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Brookway SY.....	150	163	S 34x7	Wau V	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Chicago 20V.....	163	180	S 34x7	Wau V	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Chicago 20XL.....	159 1/2	163	S 34x7	Wau V	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Clinton 45.....	163	180	S 34x7	Wau V	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A	Tim 14703	Ros	120 1/2	73 1/2	4000
Clydesdale 9.....	160	180	S 34x4	Con S4	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Coleman C-25.....	160	180	S 34x4	Con S4	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Commerce 40Z.....	163	180	S 34x7	Wau V	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Corbett 646.....	150	188	P 34x7	Bud HS6	4-4x5 1/2	25.6	L	PC	Non	G&O	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Day-Elder HB.....	144	180	S 34x4	Con 15C	4-31x5 1/2	22.5	L	PC	Non	Per	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Day-Elder HB.....	144	180	S 34x4	Bud WTU	4-31x5 1/2	22.5	L	PC	Non	Bus	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Day-Elder HB6.....	144	180	P 32x6	Con 16C	4-31x5 1/2	22.5	L	PC	Non	Bus	Zen	V	A-L	A-L	D-B-L	Tim 63720	U	4	Blo	Tim 63720	W	F	6.25	33.4	A*	Tim 14703	Ros	120 1/2	73 1/2	4000
Diamond T.....	144	180	P 30x5	Her OX	4-4x5 1/2	25.6	L	PC	Non	G&O	Str	G	Apo	A-L†	D-Cov	Tim 64600D	S	1 1/2	Spi	Tim 64600D	S	1 1/2	6.43	23.3	A	Shu 510	Ros	163 1/2	104	4500
Diamond T.....	144	180	P 32x6	Her OX	4-4x5 1/2	25.6	L	PC	Non	G&O	Str	G	Apo	A-L†	D-Cov	Tim 64600D	S	1 1/2	Spi	Tim 64600D	S	1 1/2	6.43	23.3	A	Shu 510	Ros	163 1/2	104	4500
Diamond T.....	144	180	P 32x6	Her OX	4-4x5 1/2	25.6	L	PC	Non	G&O	Str	G	Apo	A-L†	D-Cov	Tim 64600D	S	1 1/2	Spi	Tim 64600D	S	1 1/2	6.43	23.3	A	Shu 510	Ros	163 1/2	104	4500
Diamond T.....	144	180	P 32x6	Her OX	4-4x5 1/2	25.6	L	PC	Non	G&O	Str	G	Apo	A-L†	D-Cov	Tim 64600D	S	1 1/2	Spi	Tim 64600D	S	1 1/2	6.43	23.3	A	Shu 510	Ros	163 1/2	104	4500
Diamond T.....	144	180	P 32x6	Her OX	4-4x5 1/2	25.6	L	PC	Non																					

Key of abbreviations, page 50

Trade Name and Model	General			Engine										Electrical System		Clutch	Gearset		Rear Axle	Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase		Chassis Weight (lb.)						
	Standard Wheelbase (inches)	Maximum Wheelbase (inches)	Tire Size	Make and Model	Number of Cylinders	Bore and Stroke	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)	Fuel System		Ignition System (Make)	Generator and Starter (Make)		Type and Make	Make and Model		Location	No. of Forward Speeds			Universals (Make)	Make and Model		Final Drive	Type	Total Reduction in High	Total Reduction in Low	Brakes, Location	
												Carburetor (Make)	Fuel Feed																			
2 1/2 Ton—Cont'd																																
Commer 50Z...	175	220	S 36x5 1/2	Bud BUS	6-4x5 1/2	38.4	L	PC	Non	Non	Own	Zen	V	A-L	A-L	D-R	D-B-L	Tim 65706D	U	5	Blo	Tim 65706D	W	F	8.5	63.0	E	Tim 15733H	Ros	134	80	7000
Corbett 54...	152	220	S 36x5 1/2	Con KA	4-4x5 1/2	27.2	L	FP	Sim	Sim	Per	Zen	V	Eis	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	55.1	A	Tim 15733H	Ros	134	80	5325	
Corbett 56...	152	220	S 36x5 1/2	Bud KBU	4-4x5 1/2	25.6	L	PC	Bud	Bud	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	5400	
Day-Elder 1...	144	204	S 36x5 1/2	Con KA	4-4x5 1/2	25.6	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	5100	
Day-Elder 2...	160	190	S 36x5 1/2	Con 15C	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	5100	
Defiance 02...	160	190	S 36x5 1/2	Con 15C	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	5100	
Denby 43...	155	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	4925	
Diamond T 1A...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1B...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1C...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1D...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1E...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1F...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1G...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1H...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1I...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1J...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1K...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1L...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1M...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1N...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1O...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1P...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1Q...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1R...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1S...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1T...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1U...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1V...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1W...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1X...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1Y...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 1Z...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 2A...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 2B...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 2C...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4	Spi	Tim 65600D	W	F	9.25	44.4	A	Tim 15733H	Ros	134	80	6100	
Diamond T 2D...	161	190	S 36x5 1/2	Her K	4-4x5 1/2	27.2	L	PC	Non	Non	Chi	Zen	V	A-L	D-R	D-B-L	Tim 65600D	U	4</													

[illegible]

Key of abbreviations, page 50

Trade Name and Model	General			Engine					Electrical System		Clutch	Gearset		Rear Axle		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase										
	Chassis Price	Maximum Wheelbase (inches)	Tire Size	Make and Model	Number of Cylinders	Bore and Stroke	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)		Radiator (Make)	Fuel System		Location			No. of Forward Speeds	Universals (Make)	Make and Model	Type	Gear Ratios						
													Carburetor (Make)	Ignition System (Make)								Generator and Starter (Make)	Type and Make	High Reduction in	Low Reduction in	Brakes, Location		
3 Ton—Cont'd																												
Hug 86	127	P 34x7	DP34x7	Bud DW6	6-34x55	33.7 L	PC	PC	Han	You	Zen	Eis	D-R	D-B-L	D-B-L	Wis 8800B	R	R	78	46	70	A	Shu 550	Ros	Ros	78	57 1/2	6400
Hug 486	140	P 34x7	DP34x7	Bud DW6	6-34x55	33.7 L	PC	PC	Han	You	Zen	Eis	D-R	D-B-L	D-B-L	Wis 8800B	R	R	81	46	70	A	Shu 550	Ros	Ros	81	61	7400
Indiana 126	168	S 36x10	DP36x10	Her L	4-41x55	32.4 L	PC	PC	Pie	McC	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	W	W	138	7.85	80.7	B	Shu 550	Ros	Ros	138	83	7625
Indiana 626	198	S 36x10	DP36x10	Wia H	6-45	38.4 H	FP	FP	K.P.	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	138	7.75	73.6	A	Shu 550	Ros	Ros	138	83	6500
Indiana 627	216 1/2	P 34x7	DP34x7	Wia H	6-45	38.4 H	FP	FP	K.P.	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	180	7.75	73.6	A	Shu 550	Ros	Ros	180	131	6585
Indiana 628	216 1/2	P 34x7	DP34x7	Wia H	6-45	38.4 H	FP	FP	K.P.	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	180	7.75	73.6	A	Shu 550	Ros	Ros	180	131	6585
Indiana 127A	168	P 36x5	DP36x5	Her K	4-41x55	32.4 L	PC	PC	Pie	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	138	6.28	42.8	A	Shu 550	Ros	Ros	138	83	6490
Indiana 127A	168	P 36x5	DP36x5	Her K	4-41x55	32.4 L	PC	PC	Pie	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	138	6.28	42.8	A	Shu 550	Ros	Ros	138	83	6490
Indiana 627A	141	P 32x6	DP32x6	Wia H	6-45	38.4 L	FP	FP	K.P.	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	87	7.00	41.72	A	Shu 550	Ros	Ros	87	56 1/2	5500
Indiana 627A	141	P 32x6	DP32x6	Wia H	6-45	38.4 L	FP	FP	K.P.	Lon	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	S	S	87	7.00	41.72	A	Shu 550	Ros	Ros	87	56 1/2	5500
Indian Harvester 63	147	P 36x5 1/2	DP36x5 1/2	Own 63	4-41x55	28.9 L	SP	SP	K.P.	Lon	Str	Eis	D-R	D-B-L	D-B-L	Own 63	W	W	116	6.00	53.1	B	Own 63	Own	Own	116	68	5660
Kenworth J 60	175	P 36x5	DP36x5	Own 63	4-41x55	28.9 L	SP	SP	K.P.	Lon	Str	Eis	D-R	D-B-L	D-B-L	Own 63	W	W	132	7.75	46.8	A	Tim 15302	Ros	Ros	132	87	6500
Kenworth J 60	175	P 36x5	DP36x5	Own 63	4-41x55	28.9 L	SP	SP	K.P.	Lon	Str	Eis	D-R	D-B-L	D-B-L	Own 63	W	W	132	7.75	46.8	A	Tim 15302	Ros	Ros	132	87	6500
King Zetler 62A	3450	P 36x5 1/2	DP36x5 1/2	Bud DW6	6-34x55	33.7 L	PC	PC	Bud	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	W	W	170	6.25	49.5	A	Tim 15302	Ros	Ros	170	106	6200
King Zetler 62A	3450	P 36x5 1/2	DP36x5 1/2	Bud DW6	6-34x55	33.7 L	PC	PC	Bud	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	W	W	170	6.25	49.5	A	Tim 15302	Ros	Ros	170	106	6200
Kleber Speed	4000	P 36x5	DP36x5	Con 6B	6-34x55	33.7 L	PC	PC	Non	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 65600	W	W	170	7.75	41.5	A	Tim 15302	Ros	Ros	170	106	6200
Kleber Speed	4000	P 36x5	DP36x5	Con 6B	6-34x55	33.7 L	PC	PC	Non	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 65600	W	W	170	7.75	41.5	A	Tim 15302	Ros	Ros	170	106	6200
Kleber Spec	4350	P 36x5	DP36x5	Bud BUS	6-41x55	38.4 L	FP	FP	Non	R-T	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	W	W	170	10.5	56.2	A	Tim 1544B	Ros	Ros	170	106	6200
Kleber Spec	4350	P 36x5	DP36x5	Bud BUS	6-41x55	38.4 L	FP	FP	Non	R-T	Str	Eis	A-L	P-B-L	P-B-L	Tim 65700D	W	W	170	10.5	56.2	A	Tim 1544B	Ros	Ros	170	106	6200
Lang M	3850	P 38x7	DP38x7	Her YXC	6-41x55	45.9 L	PC	PC	Non	Own	Str	Eis	A-L	P-B-L	P-B-L	Tim 15300	W	W	102	9.5	86.6	A	Tim 15300	Ros	Ros	102	69 1/2	6550
Lang M	3850	P 38x7	DP38x7	Her YXC	6-41x55	45.9 L	PC	PC	Non	Own	Str	Eis	A-L	P-B-L	P-B-L	Tim 15300	W	W	102	9.5	86.6	A	Tim 15300	Ros	Ros	102	69 1/2	6550
Larabee H-1	140	P 32x6	DP32x6	Con 6B	6-34x55	33.7 L	PC	PC	Opt	Fed	Zen	Eis	A-L	P-B-L	P-B-L	Tim 65600	W	W	144	9.5	36.2	A	Shu 550	Ros	Ros	144	50	5650
Larabee H-1	140	P 32x6	DP32x6	Con 6B	6-34x55	33.7 L	PC	PC	Opt	Fed	Zen	Eis	A-L	P-B-L	P-B-L	Tim 65600	W	W	144	9.5	36.2	A	Shu 550	Ros	Ros	144	50	5650
Maecor 64	177	P 36x5	DP36x5	Bud YBU	6-41x55	32.4 L	PC	PC	Pie	Own	Zen	Eis	A-L	P-B-L	P-B-L	Tim 65700S	W	W	151 1/2	8.5	45.4	A	Tim 15302	Ros	Ros	151 1/2	95 1/2	7500
Maecor 64	177	P 36x5	DP36x5	Bud YBU	6-41x55	32.4 L	PC	PC	Pie	Own	Zen	Eis	A-L	P-B-L	P-B-L	Tim 65700S	W	W	151 1/2	8.5	45.4	A	Tim 15302	Ros	Ros	151 1/2	95 1/2	7500
Maecor 66	3400	P 36x4	DP36x4	Own AB	4-41x55	28.9 L	PS	PS	Own	Own	Str	Eis	A-L	P-B-L	P-B-L	Own AB	C	C	151 1/2	8.87	43.0	B	Own AB	Own	Own	151 1/2	95 1/2	7500
Maecor 66	3400	P 36x4	DP36x4	Own AB	4-41x55	28.9 L	PS	PS	Own	Own	Str	Eis	A-L	P-B-L	P-B-L	Own AB	C	C	151 1/2	8.87	43.0	B	Own AB	Own	Own	151 1/2	95 1/2	7500
Maek AB	3850	P 36x5	DP36x5	Bud EBU	6-41x55	38.4 L	FP	FP	Chi	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 65704D	W	W	161	9.25	44.4	A	Tim 15300	Ros	Ros	161	61	6150
Maek AB	3850	P 36x5	DP36x5	Bud EBU	6-41x55	38.4 L	FP	FP	Chi	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 65704D	W	W	161	9.25	44.4	A	Tim 15300	Ros	Ros	161	61	6150
Noble 164	188	P 34x7	DP34x7	Her L	4-41x55	32.4 L	PC	PC	Pie	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 15300	W	W	144 1/2	9.25	44.4	A	Tim 15300	Ros	Ros	144 1/2	61	6475
Noble 164	188	P 34x7	DP34x7	Her L	4-41x55	32.4 L	PC	PC	Pie	Chi	Str	Eis	A-L	P-B-L	P-B-L	Tim 15300	W	W	144 1/2	9.25	44.4	A	Tim 15300	Ros	Ros	144 1/2	61	6475
Oakbrook HH	4275	P 36x8 1/2	DP36x8 1/2	Her L	4-41x55	32.4 L	PC	PC	Han	Own	Zen	Eis	A-L	P-B-L	P-B-L	Own H	R	R	133 1/2	9.25	49.5	3	Own H	Han	Han	133 1/2	83 1/2	6875
Oakbrook HH	4275	P 36x8 1/2	DP36x8 1/2	Her L	4-41x55	32.4 L	PC	PC	Han	Own	Zen	Eis	A-L	P-B-L	P-B-L	Own H	R	R	133 1/2	9.25	49.5	3	Own H	Han	Han	133 1/2	83 1/2	6875
Pierce-Arrow XB	3750	P 36x5	DP36x5	Own XB	6-34x55	32.4 L	PC	PC	Own	Own	Zen	Eis	A-L	P-B-L	P-B-L	Own XB	W	W	125 1/2	9.25	48.1	A	Own XB	Own	Own	125 1/2	75 1/2	6280
Pierce-Arrow XB	3750	P 36x5	DP36x5	Own XB	6-34x55	32.4 L	PC	PC	Own	Own	Zen	Eis	A-L	P-B-L	P-B-L	Own XB	W	W	125 1/2	9.25	48.1	A	Own XB	Own	Own	125 1/2	75 1/2	6280
Rehberger B	162	P 36x5	DP36x5	Bud YBU	6-41x55	32.4 L	PC	PC	K.P.	Bus	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S	146 1/2	8.5	46.2	A	Shu 5550	Ros	Ros	146 1/2	90	7450
Rehberger B	162	P 36x5	DP36x5	Bud YBU	6-41x55	32.4 L	PC	PC	K.P.	Bus	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S	146 1/2	8.5	46.2	A	Shu 5550	Ros	Ros	146 1/2	90	7450
Reo GA	1985	P 32x6	DP32x6	Own BUS	6-34x55	38.4 L	FP	FP	Non	Own	Sch	Zen	Eis	A-L	P-B-L	Own	S	S	126 1/2	7.75	41.5	E	Tim 15733H	Ros	Ros	126 1/2	79 1/2	4900
Reo GA	1985	P 32x6	DP32x6	Own BUS	6-34x55	38.4 L	FP	FP	Non	Own	Sch	Zen	Eis	A-L	P-B-L	Own	S	S	126 1/2	7.75	41.5	E	Tim 15733H	Ros	Ros	126 1/2	79 1/2	4900
Republic 25	165	P 36x5	DP36x5	Con K4	4-41x55	32.4 L	PC	PC	Non	Own	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S	146 1/2	8.5	46.2	A	Shu 5550	Ros	Ros	146 1/2	90	7450
Republic 25	165	P 36x5	DP36x5	Con K4	4-41x55	32.4 L	PC	PC	Non	Own	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S	146 1/2	8.5	46.2	A	Shu 5550	Ros	Ros	146 1/2	90	7450
Republic 25	165	P 36x5	DP36x5	Con K4	4-41x55	32.4 L	PC	PC	Non	Own	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S	146 1/2	8.5	46.2	A	Shu 5550	Ros	Ros	146 1/2	90	7450
Republic 25	165	P 36x5	DP36x5	Con K4	4-41x55	32.4 L	PC	PC	Non	Own	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S	146 1/2	8.5	46.2	A	Shu 5550	Ros	Ros	146 1/2	90	7450
Stearns 19X	3490	P 36x5	DP36x5	Wau CU	6-34x55	32.4 L	PC	PC	Wau	Own	Str	Eis	A-L	P-B-L	P-B-L	Relay 60	S	S										

[illegible]

Trade Name and Model	General			Engine					Electrical System		Clutch	Gearset		Rear Axle		Gear Ratios		Front Axle Make and Model	Bleeding Gear (Make)	Standard Wheelbase								
	Tire Size		Maximum Wheelbase (inches)	Make and Model	Number of Cylinders	Bore and Stroke	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)		Fuel System		Ignition System (Make)	Generator and Starter (Make)	Type and Make	Make and Model			Location	No. of Forward Speeds	Universals (Make)	Make and Model	Final Drive	Type	Total Reduction in High	Total Reduction in Low	Brakes, Location
	Front (inches)	Rear (inches)										Carburetor (Make)	Fuel Feed															
1 Ton—Cont'd																												
Grass Premier 80	S 36x41	S 36x41	167	Wau CU	4-43x56 1/2	30 6 1/2	PC	Wau	Chi	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	7	M.M.	Tim 65700SP	W	A	25	46 0	G	Con 1803	Ros	5400
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32 3 1/2	PC	Wau	G&O	Str	V	A	Eis	A-L	D, B-L	B-L 55	A	4	S.M.	Tim 65700SP	W	R	8 25	46 0	G	Con 1803	Ros	5800
Grass Premier 80-6	S 36x41	S 36x41	167	Wau 6KU	6-41x44 3/4	32																						

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Key of abbreviations, page 50

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Brooklyn JB.	16	3200	4700	1500/142	Wis C	4-34x5	G&O	Zen	A-L	Exi	6-153	38	P. B&B	B-L 20	3	Spi	Col 54030	S	G*	Col 3204	Ros	P 32x6	P 32x6	Med	25	31 1/2	203	67 1/2
Brooklyn JB.	20	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	21	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	22	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	23	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	24	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	25	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	26	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	27	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	28	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	29	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	30	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	31	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	32	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	33	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	34	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	35	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	36	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	37	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	38	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	39	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	40	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	41	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	42	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	43	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	44	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	45	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	46	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	47	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	48	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	49	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	50	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	51	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	52	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	53	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	54	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	55	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	56	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	57	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	58	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	59	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	60	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	61	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	62	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	63	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	64	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	65	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	66	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	67	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	68	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	69	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N	Exi	12-220	30	D. B-L	B-L 30	3	Spi	Col 55001	Ros	G*	Col 5403	Ros	P 34x7	P 34x7	Med	25	28 1/2	243	64
Brooklyn JB.	70	3075	6350	2500/153	Wis SV	4-44x5	G&O	Zen	L-N																			